

The Mining Journal

London, May 12, 1961

In this issue . . .

Cyprus in Search of New Orebodies	525
Progress in Turbo Drilling	527
South Africa at the Cross Roads	529
Bright Outlook for Chinese Molybdenum	529
Development of Diesels for Mining	530
Tax Laws Alarm Thailand's Mining Industry	533
Notes on the Mineral Potential of Brazil	534
Mining Miscellany	537
Machinery and Equipment	539
Professional Directory	542
Metals and Minerals	545
London Metal and Ore Prices	547
Mining Finance	549
Company Meetings and Announcements	551

Vol. 256

No. 6560

Established 1835

Editor

U. Baliol Scott

Deputy Editor

A. Graham Thomson

Assistant Editor

R. Bowran

Display Advertisement Manager

E. S. Hooper

Circulation

Robert Budd

Published each Friday by

THE MINING JOURNAL LTD.

Directors

E. Baliol Scott
(Chairman)

U. Baliol Scott
(Managing)

G. A. Baliol Scott

R. A. Ellefsen

**15 WILSON STREET,
LONDON, E.C.2**

Telegraphic
Tutwork London

Telephone
MONarch 2567 (3 lines)

Annual Subscription £3 15s. Single copy ninepence

Cyprus in Search of New Orebodies

A REVIEW of mining taxation is recommended in a suggested development programme for Cyprus prepared by Willard L. Thorpe under the United Nations programme of technical assistance.

Cyprus has one of the oldest mining industries in the world, for there is archaeological evidence that open-cast mining for copper took place on the island 2,500 years before the birth of Christ. Today, mining is still the island's premier industry and its major source of foreign exchange. Last year mineral exports amounted in value to £9,632,000, which compares with £9,513,000 in 1959 and an all-time peak of £13,845,000 in 1956. Throughout the past ten years mining has invariably provided at least 50 per cent of all exports, while the mining companies have contributed 20 to 25 per cent of all revenue and 55 to 75 per cent of the total income tax. Employment in the industry reached 7,000 in 1955 but fell to about 5,000 in 1959.

Mining operations in Cyprus are carried on by a small number of companies and at a comparatively small number of localities. These companies have had extremely varied records. While some undertakings have been very successful, others are deeply in debt and their future is uncertain. Since 1934 the Mavrovouni orebody, discovered in 1929, has been the island's largest single source of metalliferous ore, but it will soon be depleted. In general, the industry's long-term prospects based on the presently known reserves are by no means bright. So far as asbestos is concerned, there are sufficient reserves for more than 100 years of operation at the present rate, but the outlook for copper and pyrites is much less favourable. The reserves at present known to exist indicate a probable future life of from two to three to ten years for most of the companies, even if a rather lower grade is mined than in past years. Even in the short term, both profits earned and taxes paid are thus likely to be appreciably lower unless new deposits are discovered and developed.

It is, of course, evident that this not very encouraging prospect would be radically transformed if new orebodies of commercial significance could be discovered and developed, and in this respect the possibilities of Cyprus have been far from fully explored. Several of the mining companies are engaged in intensive prospecting programmes and the use of modern methods has already led to some promising finds. At Agrokippia, for example, gravity measurement led to drilling which located an orebody 500 ft. below the surface estimated to contain 4,500,000 tons of ore. Certainly there is no reason to assume that extensive mineralization is concentrated in the orebodies which have already been discovered, for similar geological and geophysical conditions are found elsewhere on the island. It may well be that other orebodies of commercial significance exist on the slopes of the Troodos Range under the pillow-lava now covered by sedimentary rocks. This area covers about 400 sq. miles and nearly one-half of it is under prospecting leases.

At Home in Heavy Digging

MARION 181-M



The new levels of output and efficiency made possible on operations that can use large haulage units make the Marion 181-M a logical machine for expanded mining operations.

Here's a husky 9-yard machine with the traditional strength, power and endurance of Marion mining shovels—plus unusually fast cycle time for an extra payoff every day.

The 181-M has a combination of design, construction and performance features that can lower your costs and add to your profits.

If you haven't seen Bulletin 439 on the 9-yard Marion, write for your copy today.

You get **MORE** with **MARION**

MARION POWER SHOVEL COMPANY • MARION, OHIO, U.S.A.

A Division of Universal Marion Corporation

Under the Cyprus Mining Laws the mineral resources of the country used to belong to the Crown, and presumably they now belong to the government. Prospecting permits are granted for limited areas, with a maximum (but extendable) period of four years, for an annual rent of £12 per sq. mile, and with an obligation to spend a minimum amount of £100 per sq. mile per year.

The Thorpe report stresses the need for a favourable investment climate in order to encourage existing mining companies to carry out extensive exploration work on their claims. In recent years the mining industry has been profiting from investments made earlier and new capital investment has been relatively low. If it is to remain an important factor in the island's economy, the injection of additional capital is urgently required. The report states that such investment must come mainly from the private companies now operating in Cyprus or possibly from some newcomers. Any investment of public funds should be comparatively small and limited to the search for new ore-bodies. The report points out that much of the activity is carried on by foreign companies which have alternative uses for their capital in other countries. Hence tax arrangements in Cyprus must take into account the treatment of mining investments under other jurisdictions.

The taxes now applied to mining companies in Cyprus take the form of the payment of royalties and an income tax, the latter being set at 42.5 per cent of net profit. It is suggested that one way to encourage prospecting would be to allow mining companies to charge against income the exploration expenses incurred during the year. Under the existing tax regulations these costs are capitalized and then amortized over the entire life of the mine. If such expenses are incurred in a venture which proved to be unproductive, the expenditure can be deducted from income only in the year in which the mine abandons its claim. If the corporation could take its tax deduction in the same period in which the money was spent, the financial burden of carrying on exploration would be considerably eased. A similar approach should be adopted in regard to development costs which, also, are at present capitalized and pro-rated over the life of the mine.

Under the present formula, companies are encouraged to postpone exploration and development. The discovery of additional reserves may prolong the period over which past expenditures can be amortized and so reduce the annual deduction. In fact, the most economic programme would be to discover and develop new reserves equivalent to the amount annually extracted from the mine. If current deduction were permitted, the amount of capital which the company would require to invest would be reduced.

Attention is drawn to the desirability of assisting the industry by means of an adequate depletion allowance and it is further suggested that, in order to attract new mining companies to Cyprus, the government might allow mining enterprises the possibility of amortizing during the first three years of mining operations as much of their mining investment as their profits would permit. More freedom for capital transfers is also advocated.

Also proposed in the Thorpe Report is the large-scale expansion of the Geological Survey, which should be provided with first-class laboratories and instruments in order that its search for water and minerals may be carried on by the most modern geophysical methods, followed up by intensive drilling. The Geological Survey Department is seen as acting in close co-operation with the exploration departments of the established mining companies. It would exchange information and data and might offer its services to private clients at moderate fees.

In order to organize the proposed modern Geological Survey Department, the report suggests that the govern-

ment of Cyprus should request the co-operation of the United Nations Special Fund for assistance over a period of five years, which should give sufficient time to train Cypriot scientists and technicians who could carry on from there. The same purpose might be accomplished through technical assistance provided by some individual country interested in assisting in the development of Cyprus. The total capital cost for the organization of the proposed Department and its operating costs during the first five years are calculated at £1,200,000, of which it is possible that the United Nations Special Fund or some other sources might contribute one-half, leaving the balance to be found by the government of Cyprus.

The report points out that new investment in mining is necessarily rather erratic, depending upon the stage of development in which particular mines happen to be. As some indication of prospective development expenditure over the five-year period, however, the following estimates are put forward, based on discussion with the various mining companies.

	Private exploration	Private development	Public exploration	Total
1961	380	3,350	150	3,880
1962	430	3,550	125	4,105
1963	430	1,650	125	2,205
1964	330	1,250	100	1,680
1965	330	1,200	100	1,630

The figures refer to thousands of Cyprus pounds. No figure has been included in connection with oil.

At present there is considered to be no basis for anticipating either an increase in employment or production in the mining industry, except possibly at the Troulli Mines. The view is expressed, however, that with an intensive programme of exploration by the private companies and the government, it would be possible to find new orebodies which could be developed into large and important mines.

PROGRESS IN TURBO DRILLING

New bits and re-designed turbines are now claimed to enable the turbo-drill in many cases to offer speeds of penetration and duration of runs superior to those of the rotary and at lower cost.

Until recently, the high rotational speeds of the turbine reduced the life of steel roller-cone bits to as low as one-third of that in rotary drilling, while satisfactory diamond bits were not available. Largely for this reason, and despite its extensive use in the U.S.S.R. where estimates place the turbo drilled footage at more than 5,000,000 m. a year, the turbo-drill has failed to catch on in the West. It has hitherto failed to measure up economically to a good rotary except in special cases where advantage could be taken either of the low thrust requirements of the turbine, as in directional drilling, or of the absence of rotary power transmission through the drill string in ultra deep holes.

Extensive research and development work in France over the past two years has led to the evolution of general purpose diamond bits suited to the particular requirements of turbo-drilling and capable of attaining penetration speeds even higher than those normal for rotary roller cones. The new diamond bits have an average life 10 to 20 times that of the roller cones, and the same bit can penetrate a whole series of widely different formations including quartzites and unconsolidated conglomerates.

Improvements in steel roller-cone bits are not so marked, but improved flushing and greater resistance to abrasive wear together with higher strength are stated to enable the turbine in some cases to show improved performance com-



Two heads are better than one

If you have a problem on your mind involving the movement of air or other gases you can't do better than to get in touch with 'Sirocco'.

Over the past 75 years we've accumulated a vast amount of experience in this field. You'll find 'Sirocco' fans and ancillary equipment in thousands of British factories, in many British coal mines, in most British power stations, and

in industrial establishments throughout the world. Whether it's heating and ventilating, air conditioning, fume or vapour removal, dust collection, or the pneumatic conveying of bulk material, there's a "Sirocco" answer for the asking.

We'll be glad to send a 'Sirocco' trained engineer from our nearest branch to survey the situation. Can we get our heads together on *your* problem?



DAVIDSON & CO. LTD.

SIROCCO ENGINEERING WORKS
BELFAST, NORTHERN IRELAND (Belfast 57251)

LONDON BRANCH: MORRIS HOUSE, JERMYN ST., S.W.1 • Tel: WHITEHALL 3541

ALSO AT: *Manchester* • *Glasgow* • *Birmingham* • *Newcastle-on-Tyne* • *Leeds* • *Cardiff*
(Blackfriars 6210) (City 6786) (Midland 4916) (26584) (21886) (51435)

pared with the rotary both in drilling speed and cost. Maintenance problems have received particular attention. The latest turbo-drills, evolved in France, no longer demand special workshop facilities but are designed for quick and easy dismantling and assembly by one or two men using simple and easily transportable tools.

It appears, therefore, that several of the major drawbacks to turbo-drilling which have so far prevented its adoption on any scale outside the U.S.S.R., and which led to a discouraging report on an extensive field testing programme by Shell Oil and Dresser Industries only last year, have now been removed, leaving the field clear for a complete re-assessment of the position. Tribute has already been paid to progress in turbo drilling by the selection of a turbine-powered diamond coring unit of French manufacture for the American Mohole project (see *The Mining Journal*, March 10).

New kinds of turbo tools have been referred to recently in broadcasts from Russia, according to the Petroleum Press Service, May 1961. A 5,000 metre well which was drilled in the Caspian Sea last year by a turbine used equipment giving a 40 per cent increase in weight on the bit and consequent higher drilling speed, and in Azerbaijan this year extra-deep turbine drilling will account for almost 70 per cent of all drilling. This year, too, drillings of 7-8,000 m. wells is planned for western Kazakhstan using special turbine drills of small diameter and several hundred horsepower. Meanwhile, the Russians and Rumanians are introducing this method in the countries where they are giving technical assistance in exploration, so that turbo drills will eventually be in use in Egypt, Syria, India and Pakistan.

Within the mining industry, the scope of turbo-drilling will be essentially confined to deep exploratory boreholes, in which application the smaller sizes, down to 4½ in., are of particular interest. Rotary tools borrowed from the oil industry have served mining well in the past, and there is every reason to anticipate a growing acquaintance with the turbine, though on a more limited scale.

SOUTH AFRICA AT THE CROSS ROADS

Although prices of South African shares have fallen to new low levels in anticipation of May 31 when the Union becomes a republic, financial circles in Johannesburg do not discount the possibility of partial recovery in the absence of any further political setback. The main part of British and European disinvestment which followed the Union's decision to leave the Commonwealth is now believed to have been completed, while institutions in the Union seem to be prepared to absorb offerings at around current prices provided they are not too heavy.

There appear to be, however, different schools of thought, for instance, Mr. A. H. Taylor, President of the Johannesburg Stock Exchange, flatly told investors recently that local capital could be more usefully employed on expanding the economy and raising the standard of living of the Natives rather than on buying South African shares from overseas investors. The overseas investor, said Mr. Taylor, based his confidence in the country on what was done, not on what was said. If something tangible were done to show that the wind of change had reached South Africa, confidence would be restored.

How far the Union's new monetary and exchange measures will affect the issue remains to be seen. The raising of Bank rate by ½ per cent to 5 per cent, due to the severe loss of gold and foreign exchange reserves over the past twelve months, is felt in the City to be of less

importance than the new controls which are to be imposed on capital transfers by South African residents, and the fact that South Africans must now declare their foreign holdings of capital is thought to be particularly significant. Dr. Danges, the Union Finance Minister, has given an assurance that it is not intended to place any restrictions on the repatriation of foreign capital or the payment of dividends, but if the higher interest rates do not prevent a further serious decline in the Union's reserves it is difficult to see how the government could avoid extending their exchange controls to non-residents. The authorities might even introduce a Rand equivalent of security sterling and let the rate fluctuate freely for security transactions.

BRIGHT OUTLOOK FOR CHINESE MOLYBDENUM

China's impressive achievements in mining and mineral extraction in recent years leave little room for surprise. Now it seems likely that her molybdenum industry, whose output represented only 2 per cent of the world total in 1958, may rank as one of the world's important sources in a few years' time, according to the latest *Mineral Trade Notes* published by the U.S. Bureau of Mines.

While reports of large deposits have been substantiated by geological information, claims by the Chinese government that molybdenum reserves of China are the largest in the world are not supported by credible data. Up to now the main source of China's molybdenum has been the Yang-chia-chang-tzu mine in the western Liaoning province. Started as a lead-zinc producer by the Japanese in 1935 it was gradually converted to molybdenum production towards the end of 1939. Ore reserves, half of which were inferred, were then estimated at 8,000,000 tonnes averaging 0.4 per cent molybdenite. During World War II about 400,000 tons of ore and several hundred thousand tons of lead-zinc tailings from Yang-chia-chang-tzu and small quantities of ore (1.2 per cent MoS₂) from a small deposit at Ma-lu-kou in Eastern Liaoning yielded about 3,300 tons of 75 per cent molybdenite concentrate. Elsewhere small amounts of molybdenite occur with some tungsten deposits in South China and occurrences have been reported in Ching-ho and Ai-men of Sinkiang province.

The most important news of molybdenum coming out of China, however, refers to reports of three large molybdenum deposits discovered in the middle section of the Ch'in Ling mountains and in the Shansi and Kirin provinces. No grade or quantitative data has been published about these deposits but the Ch'in Ling occurrence has been described as molybdenite ore associated with pyrite and lesser quantities of chalcopyrite, pyrrhotite, and magnetite.

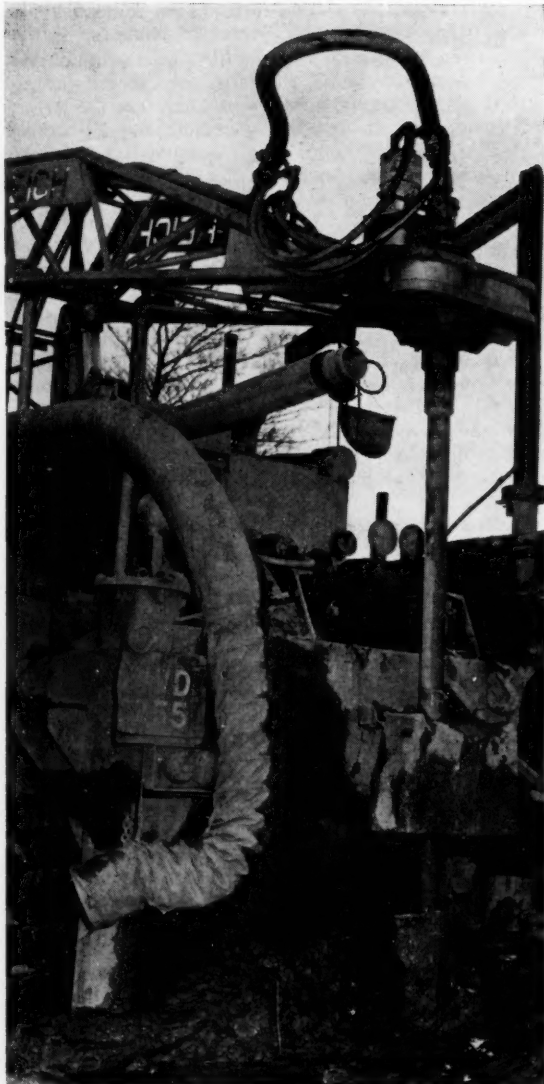
Further evidence of the growing significance of China's molybdenum industry is provided by reports that a chemical plant in Peiping was scheduled to produce molybdenum metal by the end of 1958 and the industry was expected to produce 92 to 94 per cent MoS₂ concentrate from "non-mixed" ores (presumably from the Yang-chia-chang-tzu mine) and 70 per cent concentrate from "mixed-ores" (presumably from the South China molybdenum-bearing tungsten deposits).

Output in recent years has been estimated at only 1,000 to 2,000 tons of concentrates annually, a large part being exported to U.S.S.R., East Germany and Poland. However, as the new deposits are developed exports of Chinese molybdenum may come to exert a strong influence on world markets generally.



Development of

A Sisu dump truck operating in Finland



THE introduction of bigger and still bigger diesel trucks and associated earth moving equipment has brought about tremendous improvements in design and performance of diesel engines. Up to 1939 British development of diesel engines for automotive purposes had been mainly influenced by legal restrictions on the size and speed of load-carrying vehicles, plus the fundamental economic necessity for minimum fuel consumption. The result was that Britain concentrated on power units up to about 120 h.p. with the four cycles direct injection type of engine predominating. The post war demand for the export of high speed diesel engines to countries, particularly in the dollar area, for such applications as road transport, earth moving equipment, rail traction, industrial power plant etc. found Britain, as one of the pioneers of the diesel engine, being in the invidious position of having to design at short notice larger engines, so falling in line with the current North American practice.

Interchangeable Components

Being only too aware of an increased demand for such engines both on the home market and overseas, Rolls-Royce designed and developed a range of pressure-charged engines consisting of three basic types—four cylinder, six cylinder and eight cylinder—with a power range of from 90 to 450 b.h.p.

A feature of the basic design was the introduction of the maximum number of interchangeable components which results in both economy in production and in use. The inline arrangement was chosen and this permits the maximum rationalization of parts and normally results in simplified installation. The basic engine design is simple and orthodox in its conception and complicated mechanisms have been ruthlessly eliminated. With all the designs required to satisfy the demands of such widely different duties and applications, some compromise might have been expected but this has been carefully avoided by the use of basic engines which can be assembled in a wide variety of configurations. The versatility that has been achieved can best be illustrated by quoting the following basic arrangements:

Scammell mounted Reich drilling rig operated by R.R. 6-cylinder engine

of Diesels for Mining

- (a) Four, six and eight cylinders;
- (b) Turbo-charged, super-charged and normally aspirated;
- (c) Wet or dry lubrication;
- (d) Left or right hand build;
- (e) Horizontal or vertical cylinder configuration;
- (f) Single or coupled units;
- (g) A variety of power take-off points which includes full engine power from the front of the crankshaft.

Since introducing this comprehensive range, Rolls-Royce diesels have been put to work in practically all of the world's major mining fields and for a wide variety of uses.

The Field of Transportation

It is in the field of mineral transport that this diesel is finding its widest use and typical of many successful applications is a large opencast limestone mine at Lappeenranta in Finland. This mine is producing lime and insulating materials and expects to reach an ultimate depth of at least 150 metres.

Over the past few years a remarkable change has taken place in the methods of transporting mining products in Finland. Formerly the mining industry here used narrow gauge railways for the transport of its products. Today most of the new mines use road vehicles right from the start and many of the old mines have recently changed to this method of transporting raw materials. At Lappeenranta the smooth working of the mine is entirely dependent upon road vehicles, among others Sisu dump trucks, powered by 184 h.p. Rolls-Royce diesel engines. According to the management at this mine, the performance of these trucks is excellent and the engines are proving rugged and reliable.

The construction of the trucks was based on the experience gained from the operation of American dump trucks. The designers have aimed to eliminate the weaker

features of these trucks and considerations have been paid to the peculiar Finnish conditions. For six months of the year the climate is almost arctic, the northern parts of the country being ice- and snow-bound. Conditions such as these are, of course, vastly exacting on vehicles which must operate all the year round. At this mine both the service facilities and the track garages are located in tunnels quarried into the rock wall. Thus trucks, once they descend into the mine, seldom return to ground level, but perform their tasks for life carrying limestone from the mine to the dredging plant.

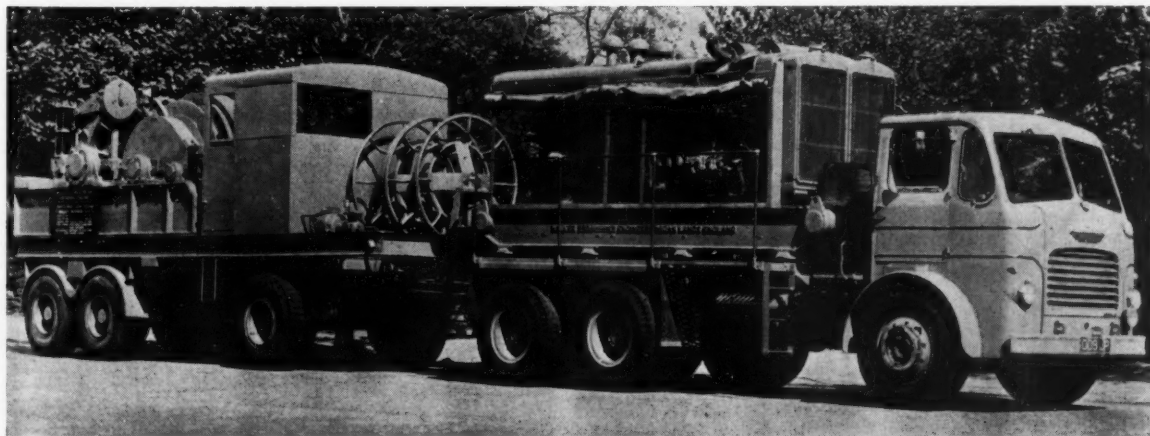
In comparing rail and road transport methods, capital outlay and running costs in Finland are very much the same, but road operation is considerably more flexible. A loading shovel is capable of loading 40 per cent more ore on to a truck than on to a narrow gauge railway wagon and at Lappeenranta five trucks are transferring as much limestone per shift as the twenty wagons used previously.

Work in Trinidad and Canada

The manufacturers' diesels are also proving attractive when used with drilling equipment. More than one hundred are currently at work in Trinidad—the first being supplied over seven years ago. Amongst the most interesting of these operations was a battery of six 6-cylinder super charged engines driving the draw works and pumps on a national rig. Indeed so successful has been the diesel engine used on drilling rigs that sales of these engines have boomed in the past few years.

Canada is also proving to be a very fertile market for these diesel engines and since the inauguration in 1953 of an oil engine division by Rolls-Royce of Canada, the engines have been imported on an ever-increasing scale. They are now firmly established as power units in road vehicles, dump trucks, oil field and industrial equipment, and numerous other applications. The reliability of the diesel engine in Canada where hauls of 3,000 miles are often done in under four days cannot be over-emphasised but experience has shown that the engines are living satisfactorily up to the reputation gained by their forebears.

Diesel electric portable winding gear from Walker Bros. incorporating Rolls-Royce unit





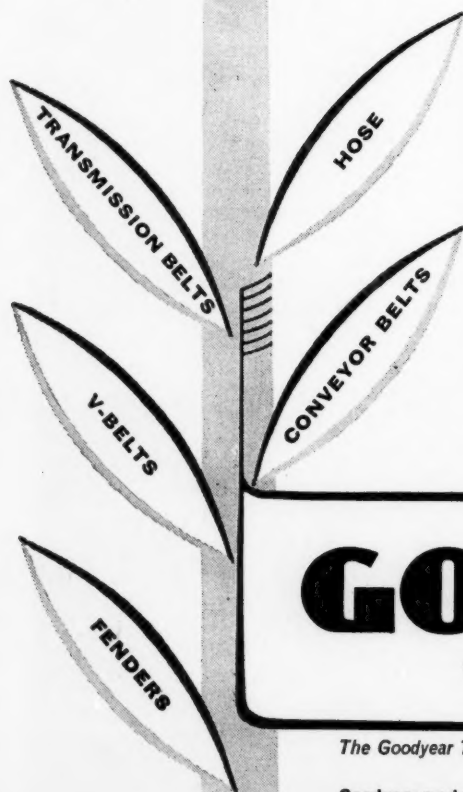
From the Goodyear family tree

LONG LIFE IN THE BALANCE

There is amazing long life in Goodyear HDNF (Heavy Duty Nylon Fill) Conveyor Belting—proved on the toughest jobs, longest hauls, highest lifts. The long life is due to the balance struck between the Nylon fill and the lengthwise tension-carrying cotton warp. Results? Exceptional impact resistance . . . strong rip and tear resistance . . . excellent troughability . . . outstanding load-carrying capacity . . . better fastener-holding ability . . . superiority proved on the most rugged duties.

Contact the Goodyear Technical Service for full details of HDNF Conveyor Belting by Goodyear—number one choice for the toughest job.

- * Nylon gives twice the impact resistance of identically made cotton fabric belting.
- * Outstanding resistance to rip and tear helps prevent costly shutdowns.
- * 10%—15% higher fastener pull-out strength.
- * Belts train easily, run smoother.
- * More Nylon means bigger pay loads.
- * Longer flex-life because efficiently woven fabric permits thinner gauge plies.
- * Mildew-proof.



GOODYEAR

THE GREATEST NAME IN RUBBER

The Goodyear Tyre & Rubber Company (G.B.) Ltd., Industrial Products Department, Wolverhampton
Export Enquiries: 17 Stratton Street London W.1

Goodyear products are manufactured in: Argentina, Australia, Brazil, Canada, Colombia, Cuba, Eire, England, Germany, India, Indonesia, Japan, Luxembourg, Mexico, New Zealand, Peru, the Philippines, Scotland, South Africa, Sweden, the United States, Venezuela. Branches, Distributors and Dealers throughout the world.

Tax Laws Alarm Thailand's Mining Industry

IN 1960, the chief minerals produced in Thailand were tin concentrates 16,588 l.tons (13,239 tons in 1959), wolfram concentrates 400 l.tons (456 tons), lead 4,600 tonnes (3,300 tonnes), manganese 528 tonnes (410 tonnes), iron ore 11,475 tonnes (6,074 tonnes) and gypsum 17,500 tonnes (3,500 tonnes). There was no recorded production of antimony last year compared with 19 l.tons in 1959.

Tin concentrates continue to hold first place and confidence among miners about the future has been restored by the improvement in world demand for metallic tin which enabled the International Tin Council to remove export controls from the end of last September. Thailand tin miners have voiced their belief that the International Tin Agreement, due to expire on June 30 this year, has achieved its main objects of alleviating unemployment and ensuring a reasonably priced supply of metal to consumers. They are strongly in favour of their country's participating in the new agreement which comes into force on July 1, 1961, which they believe will serve the best interests of both Thailand and its mining industry.

Some time this year it is expected that a New Mineral Resources Act will become law. In addition to codifying the present 40-year-old Mining Act and its numerous amendments, the new legislation will provide for the control of the production and sale of metals and metalliferous substances. Miners have expressed concern, however, regarding the proposed increase in government fees, and they have pointed to the consequences of burdening primary producers with an unreasonable proportion of the country's taxation, royalties and government charges.

Tin and Iron

Thailand's tin mining industry must, in the long run, depend upon successful exploitation of low grade deposits, particularly those located around the margins of known payable areas. For these to be economically worked both capital investment and operating costs will have to be kept at a minimum level consistent with efficiency. The present level of taxation, royalties and government charges will render certain of such deposits unprofitable to mine.

The tin miners ask that a new revenue code, in the course of preparation, should incorporate provisions recognizing the wasting nature of their mineral ore reserves and the high financial risks inherent in prospecting for and exploiting of new deposits. They are also asking for depreciation allowances consistent with the wasting nature of their assets and for the charging against income for tax purposes of expenditure incurred in abortive prospecting on non-producing properties. The amendments to the Customs Tariff code promulgated during 1960 clarified many ambiguities contained in earlier legislation, but made no provisions towards meeting the miners' long standing requests for import duty concessions to the mining industry.

The Board of Investments has under consideration the establishment of a tin smelter in Thailand under the government's promotion of industries policy. Tin miners, however, view the proposal with mixed feelings. While having no objection in principle, they are fearful that should the smelter eventually come into being the very satisfactory pricing and terms of payments conditions which they enjoy under the present marketing arrangements with smelters in Malaya may not be retained.

While output of iron ore fell by 58 per cent in 1959,

production during 1960 amounted to 12,500 tons, representing about a one hundred per cent increase over 1959.

Over the prospecting side, fairly large deposits of high-grade iron ore were found during the latter part of 1959 at Chachoengsao and Loey, the former reportedly being in an area from which the ore can be shipped by boat. The Loey deposits, however, estimated to contain 10,000,000 tons, may not be developed because of lack of transport.

Because of shortage of funds, the survey of iron ore deposits at Khao Unkrum was suspended and not resumed in 1960. In addition to a proved reserve of 5,000,000 tons, the Department of Mines reported an indicated reserve of another 5,000,000 tons of iron ore in this locality. Fuji Car. Co., a Japanese concern, was granted a concession to explore and develop iron ore deposits at Ban Bor Luang, Chiangmai, and while it plans to ship the ore to Japan for smelting, at present the area lacks transportation.

During 1960 Western Germany agreed to finance a survey for iron ore in Kanchanaburi province on the Burmese border to be conducted by the Krupp concern. Recent reports indicate that the iron ore survey proved disappointing. Because of the high capital cost of developing such deposits as were found, it was thought unlikely that the necessary finance would be forthcoming.

Other Minerals

Manganese production was being stepped up early in 1960 with production over the first two months running at 120 tonnes, compared with 410 tonnes for the whole of 1959. Last year Chieng Karn Mining Co., a privately owned Thailand firm operating with technical aid from the United States Overseas Mission (USOM), was reported to be overcoming difficult mining and transportation problems in the Mekong River area in Northern Thailand, in which remote jungle a high grade deposit was discovered a few years ago. More than 1,000 tons of ore had been delivered from the workings and production was increasing. As a result of this new source of chemical grade manganese, new battery plants have been envisaged for the Bangkok area.

A survey for copper was in progress last year in the four provinces of Chachoengsao, Nakorn Rajsima, Lopburi and Pechabun in Central Thailand according to the Thai Mines Department.

The Sumitomo Metal Mining Corporation of Japan has been scheduled to undertake a study of lead and zinc reserves in the Mae So region of Thailand early this year, and in the event of exploration being successful, the company proposed to negotiate with the Thailand authorities over exploitation of the reserves. The deposits are estimated at 3,000,000 tons of zinc ore of 35 per cent grade. Another Japanese company, the Asia Mining Co. is reported to be exploiting the feldspar deposits in the Chiangmai area of North Thailand.

The increasing importance of lignite is reflected by the recent setting up of a Lignite Authority. In 1960, the industry produced only slightly more than in 1959 (149,000 tons against 141,000 tons), but its prospects improved greatly with the opening of a lignite processing plant at Mae Moh in the north to supply both the thermal power station there, and the growing industries and power supply stations of Bangkok. The Mae Moh lignite plant was provided by Australia under the Colombo Plan and has a capacity of 1,200 tons a day.

ESTIMATE OF MINERAL RESOURCES OF READY UTILIZATION

A. Principal metallic products

Products	Average Content %	Reserves in 000 tonnes Estimated	Proved
Iron ores	60-70 Fe	1,500,000	850,000
	50-60 Fe	2,500,000	1,000,000
	under 50	35,000,000	15,000,000
NON-FERROUS METALLIC MINERALS			
(a) Utilizable in alloys with steel			
Cobalt minerals	1-2 Co	75	20
Columbite	1 Cb	40	10
Chromite	50 Cr ₂ O ₃	4,000	450
Manganese	40-60 Mn	100,000	60,000
Molybdenite	1 S ₂ Mo	40	10
Garnierite	1-5 Ni	4,000	200
Tantalite	1 Ta	70	20
Rutile	95 TiO ₂	105	40
Tungsten mins.	30-75 WO ₃	1,800	700
Vanadium mins.	0.5 V	50	15
(b) Light metals			
Bauxite	54-62 Al ₂ O ₃	600,000	250,000
Magnesite	40-50 MgO	950,000	400,000
(c) Other non-ferrous metals			
Antimonite	1-6 Sb	100	40
Beryllium	10-15 BeO	180	75
Cadmium mins.	1-4 CdS	1,500	600
Lead mins.	1-5 Pb	90,000	35,000
Copper mins.	0.5-5 Cu	50,000	18,000
Cassiterite	0.2-5 SnO ₂	180	75
Zinc mins.	10-35 Zn	20,000	8,000
Zirconium min.	1-3 Zr	550	280
ATOMIC MINERALS			
Radioactive	70,000	25,000
Lithium mins.	1-10 Li ₂ O	1,500	850
PRECIOUS MINERALS			
Gold mins.	0.0005-0.001 Au	8,000	2,500
Platinum mins.	0.00003 Pt	120	30
Silver mins.	0.0002-0.0005 Ag	5,000	1,000

B. Principal industrial materials

Products	Reserves in 000 tonnes Estimated	Proved
Arsenic	420	180
Asbestos	6,000	2,500
Barytes	10,000	4,100
Rock crystals	250	80
Fluorite	80	30
Mica	400	250
Dolomite	3,500	2,000
Graphite	1,600	900
Talc	3,200	1,800
Gypsum	14,500	6,000
Diatomite	1,200	600
Mineral coal	3,800	2,200
Apatite	600,000	250,000
Phosphorite	1,000,000	450,000
Metallic minerals		1958 1959
Bauxite	69.9	97.0
Beryllium	1.2	1.0
Lead mins.	8.5	45.2
Copper mins.	65.7	71.8
Columbite-Tantalite	0.3	0.3
Chromite	5.7	6.5
Cassiterite	0.7	0.8
Iron	5,184.7	8,841.3
Manganese	882.2	969.3
Garnierite	5.2	5.3
Rutile	0.2	0.2
Tungsten mins.	2.1	1.7
Zirconium mins.	9.5	9.8
Industrial minerals		1958 1959
Amianthus	3.5	3.4
Apatite	112.8	132.9
Barytes	62.3	50.8
Dolomite	129.4	155.4
Gypsum	130.1	183.0
Graphite	1.2	1.2
Phosphorite	532.5	873.4
Mica	1.3	1.2
Quartz	1.0	1.1
Talc	28.5	21.2
Coal	2,239.8	2,329.8
Natural gas*	300.5	427.3
Petroleum*	3,008.7	3,750.8

*quantity expressed in millions of litres.

NOTES ON THE MINERALOTE

THE official value of Brazilian minerals at the mine-head has been raised by the National Treasury for the purpose of calculating the 8 per cent Sole Tax and adjusting it to the present value of the depreciated cruzeiro. Gold, which formerly figured at 12 cruzeiros per gramme, is now quoted at 200; diamonds, until recently valued at 600 crs. per ct., are now valued at 1,500; the value per tonne of cassiterite has been increased from 38,500 to 340,000; industrial beryllium from 8,250 to 20,000 crs.; pyrolusite from 636 to 6,000; psilomelane from 440 to 3,000; manganese from 204 to 800; iron ore (hematite) from 192 to 800.

The biggest rise is in the case of mica, formerly quoted at the sole price of 5,400 crs. per tonne and now classified in five types, ranging from 100,000 to 4,000,000 crs. per tonne. The official value of tantalite has been raised from 66,000 to 240,000; rutile, from 2,860 to 22,000 crs.; scheelite, from 72,600 to 110,000 per tonne.

The tax is expected to yield 1,000,000,000 cruzeiros this year, as against 112,000,000 under the old valuation.

Conjuntura Economica, Bulletin of the Brazilian Institute of Economy, in an article on Mineral Resources, points out that although Brazil is one of the six countries with the biggest potential mineral resources, her participation in world production is still small. Two-thirds of the national territory still awaits adequate geological surveying and prospecting. The recent increases, however, in the number of chairs of geology at the Universities, in government grants for research and in the afflux of students to mining and metallurgical schools should improve the situation in the near future.

Despite present restricted knowledge the volume of mineral resources of most ready utilization is now estimated at 60,000,000,000 tonnes, as shown in the following table, compiled by the National Economy Council from authoritative sources.

The Statistical Production Service supplies the data shown at left regarding mineral extraction in thousands of tonnes in 1958 and 1959.

Regional Aspects

North-east Brazil, with poor prospects for large-scale agriculture, has excellent possibilities for mining developments, including petroleum, phosphates limestone, iron, aluminium, copper, tungsten, etc. The Amazon region has immense, although little known, mineral possibilities: iron and manganese in the Amapa Territory and Para, gold and bauxite in Amapa and Rio Branco, limestone in the Lower Amazon, rock salt in Nova Olinda, etc. Minas Gerais and Bahia, respectively, are the biggest producers of ferrous and non-ferrous metals: coal is concentrated in Santa Catarina and Rio Grande do Sul; Sao Paulo, Goias,

POTENTIAL OF BRAZIL

Parana and Mato Grosso are important centres of mining activity.

Exports of Mineral Origin

The list at right of Brazil's exports of mineral origin in 1959 and 1960 is compiled from licences issued by the Department of Mineral Production.

Exports of iron ore by Companhia Vale do Rio Doce, from the ex-British Itabira mines, increased by approximately 1,000,000 tonnes in 1960, to 4,269,613 tonnes, and accounted for 78.5 per cent of Brazil's total shipments of iron ore. The North American market took 28.91 per cent of the Itabira iron, Europe and Japan 58.54 per cent. The company's biggest clients were, in 1 tons, U.S.A. 1,214,981; Germany, 896,326; Great Britain, 667,092; Japan, 377,435; Czechoslovakia, 353,823; Poland, 286,382; Canada, 150,099.

The company's shipments consisted of lump hematite, 3,441,983 tons; run-of-mine hematite, 99,111 t.; fines, also hematite, 684,739 t. Sales closed this year for overseas shipment include 4,036,000 1 tons of lump, 1,990,000 t. of fines and 483,000 run-of-mine.

The company aims to boost exports of "itabirite", a poor mineral averaging 42 per cent Fe, of which Brazil has abundant supplies, by 20 to 30,000,000 tons annually. With this object an enterprise—Beneficiamento de Minerio de Itabira (BENITA)—has been organized with foreign assistance to instal plant at Itabira to concentrate and agglomerate the mineral. It is hoped to export concentrates containing over 60 per cent Fe, with a structure permitting their use in all types of steel furnace.

A new system of carrier belts and crushing plants is being installed at the Caue mine to increase utilization of run-of-mine hematite.

Manganese Exports

Three projects of law have been submitted recently to the Chamber of Deputies to prohibit exports of manganese from one or all States of Brazil, "in order to protect the national steel industry".

Professor Francisco Jose Pinto de Souza, of the Minas Gerais University, invited by the Council of Mines and Metallurgy to pronounce on the Bills, pointed out that consumption of manganese in Brazil averages 33 lb. per ton of steel. On this basis the reserves of Minas Gerais, Espirito Santo and Southern Bahia, alone, would suffice to produce 330,000,000 tons of steel. Production of steel now amounts to 1,859,000 tons annually and is increasing at an average rate of 11.7 per cent yearly.

EXPORTS OF MINERAL ORIGIN

Product	1959	
	tonnes	value in US\$
Bauxite	2,848.0	87,677
Beryllium	2,686.3	954,669
Columbite-Tantalite	148.7	635,194
Manganese iron	—	—
Lithium	835.0	45,335
Manganese	957,477.0	38,403,962
Scheelite	1,217.5	1,703,347
Zirconium	50.0	6,000
Clays	60.0	1,800
Barytes	46,776.0	435,292
Kaolin	30.0	900
Magnesite	210.0	8,600
Mica	899.5	1,260,124
Quartz blanks	9.0	4,564
Rock crystal	945.7	1,103,427
Abrasive quartz	—	—
Granite	1,716.0	61,393
STONES ROUGH		
Semi-precious	317.0	271,173
Ornamental	233.0	251,463
TOTALS	5,052,263.0	84,802,740

Product	1960	
	tonnes	value in US\$
Bauxite	2,050.0	63,625
Beryllium	3,491.9	1,377,477
Columbite-Tantalite	146.9	488,752
Manganese iron	19,164.4	417,685
Lithium	—	—
Manganese	850,043.7	31,297,910
Scheelite	1,670.0	2,503,719
Zirconium	—	—
Clays	47,775.0	439,399
Barytes	2,000.0	3,010
Kaolin	1,153.0	46,300
Magnesite	829.0	1,043,321
Mica	10.0	3,649
Quartz blanks	1,633.0	1,032,324
Rock crystal	20.0	6,536
Abrasive quartz	2,213.0	89,273
Granite	1,248.8	400,511
STONES ROUGH		
Semi-precious	532.7	481,321
Ornamental	16.6	19,122
TOTALS	6,373,125.0	96,416,776

New Shaft Sinking

Record Claimed for

Southern Africa

A new record for South Africa and the Rhodesias, in shaft sinking by a contractor is reported as having been achieved by The Cementation Company (Africa) (Pty.) Ltd. At the O'OKiep Copper Co.'s mine in Namaqualand Cementation sunk and lined as a simultaneous operation 541 ft. in one month. This beats the previous record by a contractor—also Cementation—of 468 ft. at the Mufulira West mine last year.

The mine shaft, 20 ft. finished dia. lined throughout with 15 in. thick walls, has now reached 2,485 ft., and in addition 12 shaft stations have been excavated; this averages 365 ft. of shaft and 2 stations excavated each month since sinking began on September 18 last. As the 12 stations excavated equate to 347 ft. if converted to shaft footage, on this basis the average is 418 ft. per month.

A 17 ft. dia. ventilation shaft, 1,987 ft. deep, was completed at the O'OKiep copper mine by Cementation last year as a preliminary to the present work.



Part of an order for 30,000 ft. of 100% 'Terylene'-reinforced rubber belting, much of which was 2 metres wide, being prepared for shipment to the Soviet Union.

'Terylene' conveyor belts go on and on and on and on...

Conveyor belting made with 'Terylene' has a much longer lease of life. If you've never used it yourself, a trial run with one belt would quickly convince you that 'Terylene'

IS STRONGER

HAS GREAT IMPACT STRENGTH

RESISTS CHEMICAL ATTACK—PARTICULARLY ACID

ABSORBS LESS MOISTURE

WON'T LOSE STRENGTH WHEN WET

RESISTS HEAT

WON'T ROT

Use 100% 'Terylene'-reinforced belting on those sites where severe or abnormal operating conditions prevail. It has similar bulk and rigidity characteristics to the cotton equivalent, and is at least three times as strong. Much longer hauls can be considered with 'Terylene', with fewer transfer points, and inclined conveying becomes easier.

Use 'Terylene'-reinforced cotton belting under ordinary working conditions. It's stronger and cheaper than the standard cotton belting.

Write for further information and literature on 'Terylene' conveyor belting to the address below.



'Terylene' is the trademark for the polyester fibre made by IMPERIAL CHEMICAL INDUSTRIES LTD., FIBRES DIVISION, HOOKSTONE RD., HARROGATE, YORKS

1873.

MINING MISCELLANY

The construction of a coking plant at Mo-i-Rana, northern Norway, has been given the go-ahead signal by the Norwegian Parliament. The plant will base its production on coal from the Svalbard mines, and 80,000,000 kroner (£4,000,000) will be invested.

★

It is understood that the Japanese firm, Nippon Mining Co. is to develop the St. Thomas Copper Mines, in collaboration with Felix Co. of the Philippines, the owners. This copper ore output is expected to be stepped up by 10,000 tons a month from its current monthly production of 50,000 tons. It is learnt that the ore will be shipped to Japan on a long term basis. The St. Thomas Copper Mine is said to have deposits of 30,000,000 tons of ore of 0.6-0.7 per cent grade. Nippon Mining Co. will also develop the Chapi Copper mine of Peru which is said to contain deposits of 6,000,000 tons of fine grade ore. The Japanese firm is conducting surveys on the Bansuera and Pencor copper mines of Peru.

★

Preparations for the sinking of a shaft at De Beers Kimberley mine are well under way, and the first of the personnel to be employed at the property are already at work. The mine has been closed since 1908, but now new methods of mining and treatment will be applied to the blue ground which was formerly considered unpayable. (See *M.J.*, p. 427, April 14, 1961). By 1964, it is expected that 2,000 loads of diamond-bearing material a day will be brought out of the mine, and by the end of 1965 the property should be on a full production of 5,000 loads a day, employing about 50 Europeans and 200 Africans.

Gold bearing ore is hauled by this giant Leyland Buffalo outfit, operated by L. Jessop, of Southern Cross, Western Australia. The outfit consists of a 230 h.p. diesel-engined Buffalo tractor, a semi-trailer tipper and a trailer tipper. The most powerful tractor built by Leyland, the Buffalo is equipped with power steering and a six-speed gearbox and has a gross train weight of 100,000 lb. The ore is taken from the Nevoria gold mine to a treatment plant at Bullfinch, a distance of about 50 miles

The British vessel "Atlantic Splendour" has transported the first 20,000 tons of gypsum in a 240,000 tons a year contract from the Dominican Republic port of Barahona to Brunswick, Georgia. The Dominican Republic salt and gypsum firm of Sal y Yeso Dominicanos loaded the eight specially prepared holds of the "Atlantic Splendour" by means of electric conveyor belts from dumps at the side of the wharves. The U.S. firm concerned is the Bestwall Gypsum Co.

★

A spokesman for the Fuji Iron & Steel Co. said recently that his company was commencing study on a proposal from Mauritania, West Africa, for the supply of between 1,000,000 and 1,500,000 tons of iron ore. He added that a French iron mining development company who own deposits in Mauritania had recently offered Japan ores on a long term contract basis. According to this proposition, the spokesman said, the annual yield of the Mauritanian mines after October 1962 would be around 4,000,000 tons and by 1966 this output could be expanded to 6,000,000 tons. The French firm would ship a quarter of the total output from Port Etienne to Japan. The Mauritanian mining, inland railway and harbour facilities were expected to be complete by that time. The ore would have an average iron content of 63.5 per cent, while the deposit content of the mines was estimated at more than 100,000,000 tons. The export price of Mauritanian iron ore to Japan was expected to be \$10.72 per ton f.o.b. Port Etienne, for 64 per cent iron content grade.

★

Construction work has been started on the new potash plant of the Texas Gulf

Sulphur Co. south of Moab, Utah, the U.S. Department of the Interior has announced. This will be the first potash mining operation in Utah. Approximately 9,450 acres of public land have been withdrawn from oil and gas leasing by the Department to protect the high-grade potash deposit. Officials of the State of Utah have co-operated in blocking out a logical area for potash development and the State Legislature recently passed legislation withdrawing State-owned lands in the area from oil and gas leasing. Texas Gulf officials state that the company expects to invest \$25,000,000 in the project before potash will be available for sale, and advise that 14 miles of all-weather road will be constructed by the State Highway Department and 37 miles of new railroad with a 7,000 foot tunnel will be built by the Denver and Rio Grande-Western Railroad. The mine shaft is being started at once. It will have an inside diameter of 22 ft. and will be carried to a depth below 2,800 ft.

★

Christiania Spigerverk is reported to have a five-year development plan which includes increasing ore production at Rodsand Gruber in West Norway by 50 per cent to 500,000 tons annually. The company's Bremanger pig iron and ferro-alloy works is to be extended, as is also its wire drawing plant in Oslo. Steel output, at present 110,000 tons a year, is to be raised by using larger supplies of scrap from its ship-breaking subsidiary at Grimstad.

★

A/S Ardal og Sunndal Verk, of Norway, announces plans to expand its aluminium production capacity from 150,000 tonnes to 300,000 tonnes over the next ten years. The output capacity of the Sunndalsora plant, in western Norway, is to be doubled to 100,000 annual tonnes and that of the Ardal unit, also in West Norway, to be increased from 40,000 tonnes to 100,000 tonnes, while a new plant with an annual capacity of a further 100,000 tonnes is to be built in western or southern Norway. Taking other Norwegian producers' plans into account, the country will have an estimated aluminium capacity of 500,000 tonnes in ten years' time and will thus be Europe's biggest aluminium producer.



The Inter-American Development Bank has announced approval of a loan equivalent to \$6,000,000 to Corporación de Fomento de la Producción de Chile for industrial mining and fishery development in Chile. According to the announcement, which was made during the first meeting of the second assembly of the governors of the Inter-American Development Bank here, the loan is for 12 years and will carry an annual interest rate of $5\frac{1}{2}$ per cent.

During the first two years of the Seven Year Plan, the Soviet non-ferrous metal industry has exceeded its targets, according to the *Economic Gazette*. More copper, aluminium, nickel, cobalt, lead, zinc and other non-ferrous and rare metals were produced than scheduled under the plan, the journal said. It stated, however, that the costs of non-ferrous metal production could be considerably reduced. Ore mining is one of the most labour consuming industries. For one ton of copper, 100-120 tons of copper ore are required, while it takes more than 300 tons of ore to produce one ton of tin. Opencast mining, the journal added, is less productive than it could be. While it has been proved that an excavator could move some 207,000 cu. m. of ore annually, the average performance in Soviet opencast non-ferrous ore mines is only 90,000 to 100,000 cu. m. per excavator.

A copper smelter plant to produce 10,000 tons of copper annually will be built at Khetri, India, in the public sector during the Third Plan for which the

Government of India has sanctioned 50,000,000 rupees of foreign exchange. It has been suggested to the government, however, that the plant should have a production capacity of 25,000 tons of copper annually. Copper ore is said to exist in an 18 mile belt in the Khetri area, only a small part of which had been explored by the Indian Bureau of Mines. In addition there is claimed to be high percentage copper ore in the nearby area of Baireth.

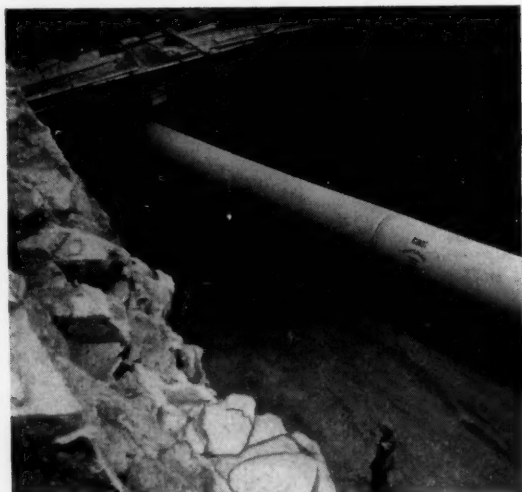
Mr. W. Rice, president of the American-owned bauxite company, Reynolds Jamaica Mines Ltd., has said that Reynolds Mines had been awarded a contract to supply 600,000 tons of bauxite to be delivered to the United States Government stockpile. Payment would be in surplus agricultural products. He said the company here would mine and ship the bauxite to the United States and, in return, Reynolds would receive the value of the delivered bauxite in products such as grains and tobacco, which the company would sell. Mr. Rice said that but for the contract there would have had to be a curtailment in the company's production.

Important new facilities for the manufacture of alumina in British Guiana, were officially inaugurated recently by Dr. Cheddi Jagan, Minister of Trade and Industry, British Guiana. The occasion was the first shipment of alumina from the Demerara Bauxite Co. Ltd.'s 230,000 tons per year alumina plant at Mackenzie, 60 miles up the Demerara

River from the Atlantic and accessible to sea-going freighters. The Demerara Bauxite Co. Ltd. is one of several bauxite mining companies which supply Aluminium Ltd.'s smelters in Canada and other countries with the basic raw material. The coming into production of the alumina plant in British Guiana completes Aluminium Ltd.'s development of a raw material base sufficient to support an eventual aluminium smelter capacity in Canada of the order of 1,000,000 tons per annum.

The discovery of rich beds of phosphate rock in the Sechura desert region of northern Peru is reported. In the last two or three years, extensive phosphate claims have been staked in the western section of this desert area by the Industrial Minerals Co. (Compañía de Minerales Industriales) of Peru and approximately \$500,000 has been spent on exploration. While the full extent of the deposit has not yet been determined, one report places the volume at 400,000,000 tons of phosphate rock assaying 9 per cent. If these figures are confirmed, the deposit will be one of the largest in the world.

United States soft coal production in the first quarter of 1961 was nearly 19 per cent below the same figure for 1960, the National Coal Association has reported. Through April 1, this year's output totalled 90,547,000 tons down from 11,209,000 tons in the same period in 1960.



VENTIFLEX TUBES

LIGHTWEIGHT PLASTIC COATED COLLAPSIBLE DUCTS
EASY AND SIMPLE INSTALLATION—ROT PROOF

Supplied for many years to leading construction companies all over the world for tunnelling work

Distributors or agents wanted for some markets

FAGERTUN FABRIKKER A/S

P.O.B. 22 DRAMMEN, NORWAY

WIGGLESWORTHS

for POWER TRANSMISSION

EQUIPMENT



Makers of
"TEXROPE"



DRIVES

PROVED
BEST
BY
BEST

FRANK WIGGLESWORTH & CO. LTD.

ENGINEERS

SHIPLEY

YORKSHIRE

Machinery and Equipment

New British Excavator

A completely new 3 cu. yd. capacity British-built excavator will help to meet the increasing demands of the quarrying and opencast mining industries for higher output per man-hour coupled with low maintenance costs. The excavator is the NCK-Rapier 1205. The unit will be on show at the International Construction Equipment exhibition at Crystal Palace, London, from June 15-24. The NCK-Rapier 1205 machines are being made at the Ipswich works of Ransomes and Rapier Ltd., who are part of the Newton Chambers Group.

The 1205 is of advanced design and is built in this country under licence from the Koehring Co., U.S. The Koehring 1205 first passed its acceptance trials in America in early 1957.

A 1205 face shovel on quarry work is producing 3,000 to 3,500 cu. yd. per 8 hour day six days a week. Another unit produces 3,000 yd. of material for a crushing plant in an 8 hour day and then operates for a further two hours removing overburden to produce a total output of 4,000 cu. yd. per day. On dragline work two 1205s with 70 ft. booms and 3½ cu. yd. dragline buckets have been working continuously on the St. Lawrence Seaway project on a 24 hour schedule. The only stops have been for routine maintenance and minor adjustments.

NCK-Rapier 1205 face shovels and draglines are now operating on various sites in England.

To meet the requirements of British industry the NCK-Rapier 1205 crane has been fitted with many features. The boom has been designed to the requirements of the latest British Standard Specification and the basic 60 ft. lattice boom can be extended to a maximum length of 150 ft. Jib booms up to 30 ft. in length are available with main booms up to 140 ft. The maximum lifting capacity of the crane is 55 tons based on 66.2 per cent of the tipping load. Power controlled boom and load lowering and an audible warning indicator are available.

The increased international demand for stripping shovels is met in this new machine. A special long range shovel front end attachment will be available shortly with 50 ft. shovel boom, 36 ft. dipper stick, rope crowd mechanism and 2½ cu. yd. bucket. This attachment has a digging reach of over 65 ft.

Some of the features that indicate the attention paid to increasing safety and reducing operator fatigue on modern excavators include the following facts:

This machine is fitted with automatic air release traction brakes by means of which the brakes are always locked on except when traction power is applied by the operator. This feature prevents runaway on slopes and improves digging efficiency. The machine cannot back away when working as a shovel and stops forward movement as a dragline.

The positive mechanical main drum clutches are another exclusive feature. A lever pull of only 12 lbs. engages the 48 in. dia. main drum clutch and feel of the load is maintained throughout engagement thus cutting down shock loading and resulting high maintenance costs.

Torque converter drive is standard equipment on this heavy duty machine to meet the widely varying power requirements inherent in continuous shovel, dragline or crane operation.

The crawler unit is of a self-cleaning design with wide smooth faced shoes to increase stability and reduce bearing pressures to a minimum. Crawler shoes up to 42 in. wide and crawler belts up to 19 ft. 3 in. long are available to suit operating conditions.

The heavy duty rock shovel attachment is equipped with twin outside dipper sticks and a full positive chain crowd.

Boom foot shock absorbers take the shock loading out of rock excavation and absorb the twisting and bending strains of heavy digging. The full digging power of the engine is always transmitted direct to the bucket teeth to provide maximum digging effort.

BI-METALLIC CELL RECORDER

The BM residual chlorine recorder, just produced by The Paterson Engineering Co. Ltd., operates on an entirely new principle for instruments of this type. This recorder has been developed to fulfil the need for a unit which is strongly built and accurate in operation and yet requires very little maintenance. Operating on the bi-metallic cell principle, its design is considerably less complicated than that of instruments using colorimetric measurement.

The recorder employs a small perspex constant head chamber of orthodox overflow type in which the sample water is received and measured. The incoming supply is controlled by a small valve manipulated from the front of the

cabinet from where the flow is visible at all times. The water then passes to a larger mixing chamber, also of perspex, in which it is thoroughly mixed with a reagent by a swirling action. The reagent used is a simple buffer solution to which is added a small percentage of a specially developed compound known as BM 18 which prevents the formation of mould growth without affecting the chlorine residual. The solution is fed by gravity on a constant head principle through special drip valves from a vessel having sufficient capacity for an eight day supply.

The reagent treated sample water then passes to the specially designed BM cell where the chlorine is measured by two electrodes, of ample area which produce current proportionately to the chlorine concentration. Two wire wound drums with metallic brushes deliver the output from the electrodes without the necessity of amplification, to an electronic indicator and recorder which incorporates a highly sensitive circuit. A circular chart calibrated from 0 to 1 part per million provides a seven-day record and a sweeping pointer gives rapid visual indication on a large peripheral scale.

DENSE MEDIUM COAL WASHER

Nortons-Tivdale Ltd. are exhibiting at the American Coal Show in Cleveland their new Norwalt dense-medium separating process originated by Dr. P. J. Van der Walt a director of Nortons-Tivdale South Africa (Pty.) Ltd. The plant was subsequently developed by Nortons-Tivdale Ltd.

The Norwalt process was first used in a coal washery erected at Carnarvon anthracite colliery in Natal, South Africa. During the first few months of the plant's operation, extensive and very successful tests were carried out by the South African government's fuel research department.

The company claims that the Norwalt process combines all the advantages of

One of the first NCK-Rapier 1205s with face shovel at work on an opencast coal site in the Midlands

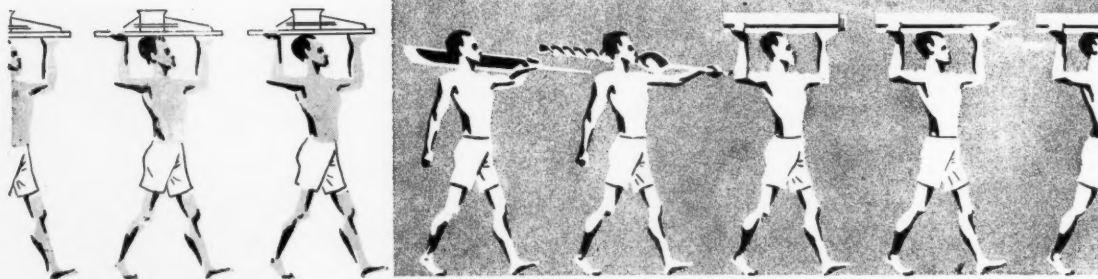


CONRAD BANKA

The world renowned portable platform drill

*A century old, yet in great demand.
Imitated, but not excelled!
For prospecting and reliable
evaluation of ore bearing alluvials
and of bauxite deposits.
For foundation testing through
loose or soft formations.
Transportable in one-man
loads for operation anywhere!*

Sole Makers: Conrad Stork



Works and head office: P.O. Box 134 - Haarlem-Holland

Agents for the United Kingdom:

Richmonds (London) Ltd - Finsbury Pavement - House 120, Moorgate London, E.C. 2

both deep and shallow vessel separation while embodying the high operating efficiency and capacity of a deep vessel in a shallow bath. The designer has done his utmost to ensure simplicity and the provision of a simple method of concentrating the sink fraction to a single discharge outlet, from which only a short vertical lift is required to lift the sinks out of the liquid, has gone a long way to achieve this aim.

The elevating device is largely a matter of choice. It can be in the form of a wheel, drum, bucket elevator or scraper. By separating the elevating mechanism from the vessel itself, turbulence in the washing area is thus minimised and separating efficiency is improved. The shallow cylindrical tank has a flat base and conical inner shell which houses the driving mechanism for push plates which remove the sinks.

In operation the vessel is fitted with a suitable dense medium suspension which continuously overflows a weir in the outer wall of the vessel. The push plates impart a slow rotational motion to the medium in the vessel, and just sufficient turbulence is created to maintain a uniform specific gravity.

The raw coal is fed to the surface of the suspension inside an annular curtain about the centre of the vessel. It is then forced under the curtain into the separating zone, the sinks continuing towards the base of the vessel whilst the floats rise to the surface of the medium and take a widening spiral path towards the overflow weir. The sinks are conveyed by the slowly moving push plates to a single outlet chute leading to the sinks elevator.

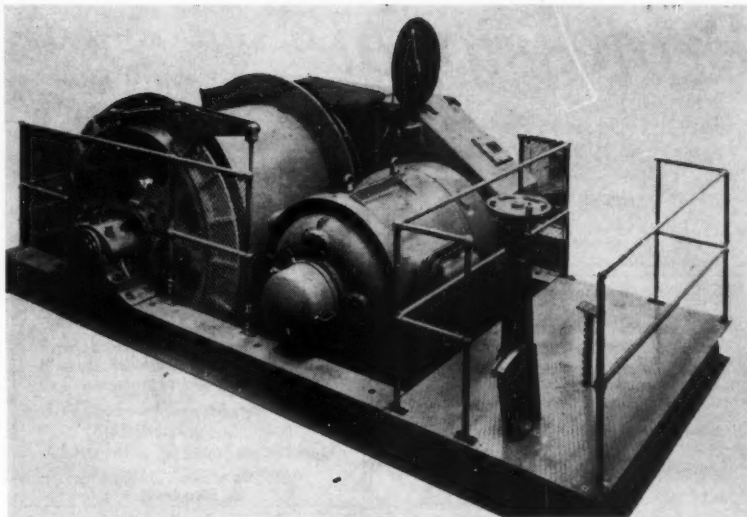
The capacity of the Norwalt separator may range from 50 to several hundred t.p.h. of raw coal, the only variant being the diameter of the vessel, while the depth of suspension in all units is only approximately 3 ft., proved adequate for efficient separation. Coal down to $\frac{1}{4}$ in. size can be efficiently separated in the vessel and when large lumps are to be treated an overflow weir of novel design is fitted so that the circulation of medium is not excessive.

The Norwalt separator, whilst primarily developed as a coal preparation machine, can be used, it is claimed, in the mineral separation field or in any process where solids are to be separated according to their differing specific gravities in a dense-medium suspension.

HAULAGE UNITS FOR INDIAN COLLIERIES

John Tinsley Ltd. has been awarded recent contracts for mining equipment approximating in value to £250,000. These contracts were for haulages etc., for India, Korea and Costa Rica. The major contract involves the manufacture and supply of 100 and 150 h.p. electric haulages destined for use by Singareni Collieries Ltd., in Hyderabad.

The haulages are designed with fully enclosed gear boxes. The 150 type is single drum, 5 ft. dia. by 4 ft. wide. Rope capacity is 5,000 ft. 1 in. dia. rope and speed is 8 m.p.h. The steel gears are fully enclosed in a steel gear box, while the ball and roller bearings are likewise enclosed. Bedplates are of fabricated steel. The flameproof electrical equipment is supplied by A.E.I. Ltd. The contract also included a number of 30



A 150 h.p. haulage by John Tinsley Ltd.

h.p. haulage equipments. Delivery will be completed this year.

It is of interest that John Tinsley Ltd., in collaboration with Jardine Henderson, Ltd., of Calcutta, now has concluded arrangements whereby Tinsley-designed haulages and winders will be made in India. These equipments will be marketed in India by George Miller and Co. Ltd., Calcutta, and several of them are expected to be in use before the end of 1961.

John Tinsley Ltd. also have been successful in securing a contract for 150 h.p. haulages, for use in Korea, and since receipt of the original order have received further contracts for 120 h.p. equipments. Orders have also been secured for winding equipment to be installed in Rhodesia.

CONTROL OF PULP DENSITY

The specific gravity indicator-recorder used at McIntyre Porcupine Mines, Canada for measuring specific gravity of classifier overflow pulps is a modification of the Haultain density indicator and was designed by Mr. T. R. Morton. The indicator, used at the company's Schumacher, Ontario, gold reduction plant, has been the subject of an interesting article in *The Northern Miner*.

In operation, a sample fraction of the pulp to be measured is introduced near the bottom of a pot and allowed to overflow the top and return to the circuit. High pressure air is directed through a restrictor tube and thence to atmosphere, through a bubble pipe set at a fixed depth in the pot.

The restrictor tube is made by cementing a piece of thermometer tubing in a short pipe nipple. Two branch lines are teed off the air line supplying the bubbler pipe, one going to a sloping manometer tube, the other to a Bristol recording pressure gauge. Since the submerged depth of the bubble pipe is fixed, variation in air pressure in the metering system will be governed solely by the density of the pulp in the pot.

Instrument readings are periodically checked against standard pulp density measurements. Most commonly encountered sources of error in instrument readings are found in a build-up of moisture in low points in the low pressure air system, which is cleared by purging with high pressure air, or alternatively a build-up of sands in the bottom of the pot, which is cleared up by draining and washing out the pot. Infrequently, trouble may be encountered due to a leak in the low pressure air system, or faulty pulp sampling due to wear of some components.

Although the above system of instrumentation does not eliminate the problem of manual operating control, it is a labour-saving device and does offer a number of advantages. Reasonably accurate and continuous readings and independent recording of these are provided over the full 24 hours of each day, and obviously, unauthorized shutdown of equipment or change in operations are immediately apparent. An indirect benefit might be cited in improved standards of operations, where the operator accepts the challenge to produce the best possible chart line for his shift.

LOCATING THE CENTRE OF GRAVITY

Throughout industry, B.S.3318 should be found useful. Prepared at the request of the Federation of Manufacturers of Construction Equipment, this new standard gives well-tryed, simple methods suitable for determining the centre of gravity and the overturning angle of most heavy objects, from a grabbing crane to a tractor. It will be of practical assistance to designers, manufacturers and customers alike and should make an important contribution to the reduction of those accidents caused wholly or in part by unstable equipment or vehicles.

Copies of the standard may be obtained from the British Standards Institution, Sales Branch, 2 Park Street, London, W.1, price 5s. each.

Professional Directory

THE ABEM COMPANY

Geophysical Consultants and Contractors

Airborne Electromagnetic, Magnetic, and Radiometric Surveys
All types of ground geophysical surveys
Seismic investigations on land and water
Manufacturers of a complete range of geophysical instruments

Danderydsgatan 11, Stockholm, Sweden
Cables: Prospecting
Telex: 1459 Tel.: 23 02 55

AUTAIR LTD.

Contract Aviation Services

Complete aeronautical services with helicopters and STOL aircraft for field operations and exploration.

75 Wigmore Street, London, W.1.

Telephone: Welbeck 1131

and at

P.O. Box 2867, Salisbury
S. Rhodesia

DUNCAN R. DERRY

CONSULTING GEOLOGIST

Room 602 • 217 Bay Street,
Toronto, Ontario, Canada

Tel. OFFICE - EMPIRE 3-6528
HOME - CRESCENT 8-2524

DONALD GILL

Mining Engineer

535 Salisbury House,
London, E.C.2

Tel.: National 0591

AB SWEDISH GEOPHYSICAL SURVEY

Airborne magnetic and electro-magnetic surveys. Airborne radio-active spectrometry. Ground surveys.

Alströmergatan 16, Stockholm K,
Sweden

Cables: Airexplorer
Tel.: 54 74 78, 54 74 79

JOHN A'C. BERGNE

A.R.S.M., M.I.M.M.

Mining Engineer

539 Salisbury House,
London, E.C.2.

S. H. GLASSMIRE & ASSOCIATES

CONSULTING
GEOLOGISTS • ENGINEERS

214 COLLEGE STREET,
SANTA FE, N.M. U.S.A.

Offering Professional Services in
LATIN AMERICA

Mineral Examinations, Inspections,
Evaluations. Reports and applications
for private and Government financing.

AEROFALL MILLS LIMITED

ORE DRESSING ENGINEERS

129 Adelaide St. West
TORONTO, CANADA

BEWICK, MOREING & CO.

Consulting Mining Engineers
and Mine Managers

84-90 CHISWELL STREET,
LONDON, E.C.1

Cables: Bewick Tel.: Moorgate 9691

Branches at

Johannesburg, S. Africa. Perth, Australia

DANIEL C. GRIFFITH & CO. LTD.

Assayers to the Bank of England

Analytical Chemists, Samplers, Technical
representatives in sales of Ores and Metals at
U.K. and European Ports and Works

Sampling and Analyses of

Precious Metals, Rare Earths, Base
Metals, Ores and Residues, Etc.

27/33, Paul Street, London, E.C.2

Tele: MONarch 1314 (3 lines)
Cables: Gryffydd, London

Aero Service Corporation

Complete airborne geophysical and mapping
service, including more than a million miles
experience throughout the world, with Gulf
magnetometer, Newmont electro-magnetic
detector, and National Research Council
scintillation counter.

Also: photo-geologic studies, Shoran surveys,
resources inventories.

Avenida America 2-11^B, Madrid, Spain

210, East Courtland Street,
Philadelphia 20, PA., U.S.A.

Boland Development Company Ltd.

Mining Engineering Contractors

Head Office: Suite 505, 100 University Ave.,
Toronto, Ont. Tel.: EM. 4-0119

Branch Offices: P.O. Box 432, Noranda, Que.
Tel.: RO. 2-4865

P.O. Box 352,
Butte, Montana, U.S.A.
Tel.: 5144

C. S. Boland, P.Eng., Ontario & Quebec
President & General Manager

HEATH & SHERWOOD CHEMICAL GROUTING LIMITED

Cable Address Sherdrill

6-8 Hudson Bay Avenue,

Kirkland Lake Ontario, Canada

SWORN WEIGHERS & SAMPLERS
OF ORES - METALS RESIDUES

AGENCE MINIERE & MARITIME

Stevedoring - Storage - Shipping

Representatives of Shippers at
European Ports and Works

2 Van Bree Street, Antwerp, Belgium

Telegrams: Rentiers, Antwerp Telex: 3169

COOKE, EVERETT & ASSOCIATES, INC.

Geologists Engineers Geochemists
MINING—PETROLEUM—GROUND WATER

Resources—Exploration—Valuation
Utilization—Marketing—Investments
Research—Translations—Photogeology
Geophysics—Engineering Geology

MINES REGISTRY ASSOCIATES

421 Court St. P.O. Box 2229
Reno, Nevada, U.S.A. Cable: COVER

OFFICES: Calif.—N.M.—N.Y.—Ore.—
Wash. D.C.—Argentina—Canada—
India—Peru

HEATH & SHERWOOD DRILLING (EASTERN) LIMITED

Domestic diamond drill
contracting and management

Cable Address: Sherdrill

6-8 Hudson Bay Avenue,

Kirkland Lake, Ontario, Canada

**HEATH & SHERWOOD DRILLING
S.A. LIMITED**

Foreign diamond drill
contracting and management

Cable Address : Sherdrill
Bank of Bermuda Building,
Hamilton, Bermuda

KNAPP & BATES LTD.

Ore Dressing Engineers

14-17, Finsbury Court,
Finsbury Pavement,
London, E.C.2

Tel.:
MON 0840

Cables:
Flowsheet, London

ARTHUR NOTMAN

Consulting Mining Engineer

55 Liberty Street, 18th Floor,
New York 5, N.Y., U.S.A.

Telephone : BARclay 7-9484

HUNTING SURVEYS LIMITED

SURVEYORS, PHOTOGRAMMETRIC
ENGINEERS AND CONSULTANTS
AIRBORNE AND GROUND
GEOPHYSICAL SURVEYS AND
SERVICES

6 Elstree Way,
Boreham Wood, Herts.

Tel.: Elstree 2214 Cables: Astereo
London Office :
4 Albemarle Street, London, W.1.

**LAKEFIELD
RESEARCH OF CANADA LIMITED**

Metallurgical and Chemical
Research—Ore Testing
Analysis and Assaying

P.O. Box 430,
Lakefield, Ontario, Canada
Phone : OLiver 2-3341

**POWELL DUFFRYN TECHNICAL
SERVICES LIMITED**

Consulting Engineers
(Mining, Chemical, Industrial)

7/17 Jewry Street
London, E.C.3

Cables: Technicoal
Telephone: ROYal 0141

**HUNTING TECHNICAL
SERVICES LIMITED**

Geological Mapping and Mineral Exploration.
Photogeology. Geophysics. Geochemistry.
Aerial and Ground Surveys.

6 Elstree Way,
Boreham Wood, Herts.

Telephone : Cables :
Elstree 2214. Huntco, London
London Office:
4, Albemarle Street, London, W.1.

**LEA CROSS GEOPHYSICAL CO.
LTD.**

Gravity, Magnetic & Electro-
Magnetic Surveys

Geochemical Surveys and Analysis

HANWOOD, SHREWSBURY, ENGLAND
Tel.: Hanwood 296

JOHN TAYLOR & SONS

Mining Engineers, Consultants
and Mine Managers

Technical Buying and Shipping

Suffolk House,
5, Laurence Pountney Hill,
London, E.C.4

Cables: Rolyat, Cent, London
Tel.: MINcing Lane 7351 (3 lines)

A. W. JOHNSTON

Geologist, P.Eng.

16th Floor
100 Adelaide Street West,
TORONTO 1

Phone EM. 3-1493

LEDoux & COMPANY, (INC.)

Metallurgical Chemists — Assayers
Samplers, Weighers and Inspectors
Chemical & Instrumental Analysis of
Ores, Concentrates and Metals
Method Research & Development

359 Alfred Avenue
Teaneck, N.J., U.S.A.

CONRAD W. THOMAS & ASSOCIATES

Mineral Industries Consultants

VIA GUERRAZZI 1/D ROME, ITALY
Tel. 503-500

EXAMINATION-EVALUATION
ENGINEERING-GEOLGY-EXPLORATION
DIVERSIFICATION-FINANCE

Experienced in :
Europe-Africa-Middle East
North & South America

W. P. JOHNSTON

Consulting Mining Geologist

Specializing in valuation of Ore
Deposits of the Western
United States

210 West Second Street,
Reno, Nevada

Tel : Office — FAirview 9 2302
Home — FAirview 2 0751

**McPHAR GEOPHYSICS
LIMITED**

Geophysical Surveys and
Electrical Prospecting Equipment

Including
INDUCED POLARIZATION AND
AUDIO FREQUENCY MAGNETICS

139 Bond Avenue, Don Mills,
Ontario, Canada
Cable: "McPhar Toronto"

WRIGHT ENGINEERS LIMITED

Metallurgical, Mining and
Industrial Plants, Marine Terminals
Bulk Handling Facilities
Economic Studies, Complete Design

850 WEST HASTINGS STREET
VANCOUVER 1
BRITISH COLUMBIA

Telephone : MUTual 3-7595
Cables : "Metwright"

DAVIES INVESTMENTS LTD.,

Private Bankers (Gross assets
exceed £2,500,000), are paying
7½% p.a. interest on deposits for
the eighth year in succession, with
extra ¼% added annually on each
£500 unit. Details and Audited
Balance Sheet from Investment
Dpt. MN., Davies Investments
Ltd., Danes Inn House, 265
Strand, London, W.C.2.

AN EXPERIENCED

GEOLOGIST/EXPLORATION ENGINEER

is required immediately by a well-known British mining company to take charge
of a Reconnaissance Prospecting investigation in East Africa and elsewhere.

Applicants must be over 25 years of age and preferably under 40, and be in
possession of an honours degree in Geology or Mining Geology. The principal
requirement is a practical and imaginative approach to a variety of geological
problems. As the successful candidate will be responsible for the organization and
direction of all aspects of an investigation, only men of high all-round ability need
apply.

Salary depending on experience, about £2,400 p.a. plus allowances.

Please send particulars of age, qualifications and experience in confidence to
Box 980, c/o Walter Skinner, Ltd., 20, Copthall Avenue, London, E.C.2.

**everything
for safety
everywhere**

Air Craft Seat Belts
Air Compressors
Breathing Apparatus
Motor Car Safety Harnesses
Diving Equipment
Dust Respirators
Gas & Fume Respirators
Protective Clothing
Resuscitation Equipment
Safety Helmets
Smoke Masks & Helmets

SIEBE, GORMAN & CO. LTD.,
Neptune Works, Davis Road, Chessington,
Surrey. Telephone: Elmbridge 5900
Manchester Office: 274 Deansgate
Telephone: Deansgate 6000

**SIEBE
GORMAN**

A Member of The Fairey Group of Companies

RENOLD

**the world's largest manufacturers
of precision chain
offer**

143

**chains
for
power
transmission**

*The RENOLD range of products is
available from 152 distribution and
service centres in over 100 countries*



RENOLD CHAINS LIMITED • MANCHESTER



Metals and Minerals

Bright Outlook for Cobalt Producers

Consumption of cobalt by the Western World will double within the next ten years to about 31,000 tons, declared M. Charles Piedboeuf, chairman of the Cobalt Information Centre of Brussels, speaking at a Cobalt Conference organized by the French fine and special steel industry in Paris last weekend. He also forecast that cobalt producers will be able easily to meet the foreseen increased demand.

In Katanga, the world's biggest producer, cobalt capacity will be raised this year to 12,000 tons. Last year Katanga produced 8,242 tons out of the West's total output of 15,100 tons, and its production constituted a stabilizing element in the world market.

Reviewing world cobalt output over recent years M. Piedboeuf said that total production in 1956 amounted to 13,500 tons, of which Katanga supplied 8,567 tons, and rose to the all-time high of 16,000 tons in 1959. This increase, he said, was mainly due to a rise in the Rhodesian output which jumped from 788 tons in 1956 to 2,152 tons in 1959 and the increase in West German production from 990 tons to 1,470 tons over the corresponding period.

In contrast, U.S. production which had increased from 885 tons in 1956 to 1,823 tons in 1958 dropped back sharply in 1960 to only 742 tons. This was because world prices were no longer sufficient to cover costs of a number of U.S. mines. The world price which had soared by 50 per cent to \$2.60 per lb. from 1947 to 1952 fell sharply in recent years. It now stands at \$1.50 in spite of the fact that production costs had increased and that the quality had been considerably improved.

As was pointed out in *The Mining Journal*, April 7, p. 393, the salient feature of cobalt developments last year and of the previous year was the sharp increase of the total sales of cobalt to industry. An important trend in industrial consumption now will be for large development for magnetic uses and for steels containing cobalt. For a long period the strategic uses of cobalt and in particular stockpiling by the U.S. Administration had boosted demand, but since 1952, the development of the market had been highlighted by the expansion of peaceful uses of cobalt, notably outside the United States. Last year, in fact, consumption was described as stagnant in the United States, but M. Piedboeuf thought that 1961/1962 would see a resumption of demand there.

M. E. M. Elchardus, of the research department of the French firm Ugine, said that French requirements are fully met by Moroccan cobalt mined by the French firm Omnium Nord Africain whose subsidiary operates in Bou Azzer and Arbar. Output was 1,260 tons in 1960 against 926 in 1959 and reserves are at present estimated at 1,000,000 tons of ores. The Moroccan cobalt ores contain arsenic and special processes were required to remove it and obtain a completely pure metal. At present two processes and advanced techniques were used in France to obtain cobalt metal in all the forms required by consumers. One process is handled by Ugine and the other by Nobel-Bozel.

AUSTRALIAN RUTILE

The Australian rutile (titanium ore) shipment market remains in the doldrums, and prices continue to drift lower. For 95 per cent material most dealers now suggest a range of from £24 to £24 10s. per ton c.i.f. compared with £24 10s. to £25 recently.

The general slackness of demand appears to be mainly responsible for the persistent downward tendency than any particular pressure to sell. Buyers generally, most dealers claim, are fairly well covered for most of this year, although one source alleged that probably not all of them are committed beyond June or July. Even so, unless demand did stage a worthwhile recovery on a broad front, prospects of a reversal of the downward trend which has been evident for so long seem slim.

Meanwhile, it is understood that Australian producers are still meeting periodically to seek ways and means of rationalizing the industry there, but so far without success.

U.K. TELLURIUM PRICE RAISED

The United Kingdom domestic delivered price of tellurium has been raised by 9s. to 37s. 6d. per lb. for minimum 100 lb. lots. This brings it approximately into line with the higher U.S. price of \$5.25 per lb. from \$4 a lb. The price of the material in Canada is in line with the U.S. price.

ANGLO-CANADIAN TALKS ON URANIUM

Talks between Canada and the United Kingdom on a British commitment to buy 12,000 tons of Canadian uranium in the period 1963-66 will open in Ottawa on June 12. Sir Roger Makins, head of the British Atomic Energy Authority will represent British interests.

Mr. W. M. Gilchrist, president of the Crown Uranium buying agency Eldorado Mining and Refining, told a Canadian House of Commons research committee recently that mines which might otherwise close in 1964 or 1965 could be kept going for nearly two more years if the \$200,000,000 contract with the U.K. was fulfilled.

Canadian uranium oxide delivered during the final quarter of 1960 totalled 3,175 tons worth \$67,119,370 reports Eldorado Mining and Refining Ltd. In the corresponding period of 1959 deliveries amounted to 4,246 tons worth \$86,099,570. Total deliveries for the whole of 1960 amounted to 12,338 tons (15,909 tons) worth \$262,124,140 (\$323,176,310).

JAPANESE NICKEL PROSPECTING

Japanese nickel refineries are actively seeking new nickel ore supply sources in Indonesia, Rhodesia and Australia to lower their production costs in view of

the approaching liberalization of imports of nickel ingots.

Staff engineers of the Sumitomo Metal and Mining Co., a leading non-ferrous metal manufacturer, who are based in Australia, will leave for Tasmania this month to prospect for nickel.

This company also plans in conjunction with the Shimura Kako Co., another nickel refinery, to develop nickel mines in Southern Rhodesia, and has already sent a survey group there.

Five nickel producers in Japan, including Sumitomo and Shimura, are considering a plan to establish jointly a company to carry out prospecting and development of nickel mines and other mineral resources in the Celebes, Indonesia.

★

Russian production of nickel last year amounted to 38,200 tons. This year it is aimed to raise output to 43,400 tons which would be 23,300 tons more than five years ago. A serious shortage of nickel threatens in Russia, however, as more of the metal is used in jet engines, rockets, space vehicles and other products.

★

The Hanna Mining Co. has announced the commencement of sales of nickel to the steel industry from the nation's only large nickel deposit at Riddle, Oregon. For the last six years the company has shipped all of the nickel produced—some 100,000,000 lb.—to the government for stockpiling purposes. The Riddle plant can produce up to 22,000,000 lb. of nickel a year.

PALMIET CHROME TO ERECT NEW PLANT

Negotiations have been made between Palmiet Chrome Corporation and West Rand Consolidated, for the establishment of a plant adjacent to the South Reduction Works, to produce ferrochrome and allied products, according to the chairman of West Rand Consolidated.

Since the end of 1960, agreement has been reached whereby West Rand will acquire a 20 per cent interest in the re-organized capital of Palmiet Chrome and will participate in the provision of loan facilities for the establishment of the first plant unit. The total commitment for West Rand is estimated to be approximately £200,000 over a period of about 18 months.

★

The U.S. General Services Administration is to sell 46,138 tons of chrome-bearing materials and 151,000 lb. of ferro-chromium alloys from the national stockpile. Bids are invited by June 19 by the Project Administration Division of GSA's Defence Materials Service.

GALLIUM ARSENIDE FOR MICROWAVE UNIT

An advanced electrical device for utilizing gallium arsenide has been developed by Bell Telephone Laboratories for ultrasonic delay lines where its operation at high frequencies and wide bandwidths enables large amounts of information to be stored.

The new device will also be used to study the acoustical properties of materials at high ultrasonic frequencies. It is not yet in commercial production.

(continued overleaf)

EASTERN SMELTING CO. LTD

TIN SMELTERS

Head Office:

ST. SWITHIN'S HOUSE

11/12 ST. SWITHIN'S LANE, LONDON, E.C.4 TELEPHONE: MANSION HOUSE 2164/8

Smelting Works:

PENANG, FEDERATION OF MALAYA

Branches throughout the Federation of Malaya

Penang Office and Works:

DATO KRAMAT ROAD, PENANG

Selling Agents:

VIVIAN, YOUNGER & BOND LTD

PRINCES HOUSE, 95 GRESHAM STREET, LONDON, E.C.2

TELEPHONE: MONARCH 7221-7 TELEGRAMS: BOND, STOCK, LONDON TELEX: LONDON 8665 CABLES: BOND, LONDON

House purchase loans



COLLINS are the people to take the worries out of your home finance. All types of mortgage arranged; enquiries on general insurances and investments taken care of also. Advice is free and carries no obligation: please use it.

**Maximum Advances at
Minimum Interest Rates
currently prevailing**

Send now to B. M. COLLINS & CO LTD

Mortgage Dept. M. J. 1

**9/10 FENCHURCH STREET, LONDON, EC3 (Tel.: MAN 3721-3)
and at
33 DINGWALL ROAD, CROYDON (Tel.: CROYDON 6172-3-4-5-6)
64 CROSS STREET, MANCHESTER, 2 (Tel.: DEANSGATE 8043-4)**

NAME _____
ADDRESS _____
Age _____ Occupation _____ Salary _____

**NON-FERROUS METALS
ORES AND MINERALS
IRON AND STEEL**

HENRY GARDNER & CO. LTD.

*Members of the London Metal Exchange and
:: suppliers to markets all over the world ::*

•
Cables:

Nonfermet London

Telex:

London 28547

Telephone:

Mansion House 4521

•
Head Office:

**2 METAL EXCHANGE BUILDINGS
LEADENHALL AVE. LONDON, E.C.3**

Copper • Tin • Lead • Zinc

(From Our London Metal Exchange Correspondent)

During the period under review copper and tin prices have gone up whilst the prices for lead and zinc have remained relatively unaltered.

COPPER IN FIRM DEMAND

The price of copper on the London Metal Exchange was extremely firm at the beginning of the week, with the market reaching new high levels for the year. At the time of writing it is impossible to judge whether the setback in the middle of the week is heralding in a period of minor price changes, or whether it is only a halt in the major upward trend.

Outside London demand for metal has continued good from the Continent and Japan, whilst in the United States all reports continue to be of a bullish nature. With the customs smelter intake price for No. 2 scrap now standing at 26½/26½ c. per lb., every indication is that further upward adjustments in the official copper prices are likely to take place in the not too distant future.

In spite of an increase of 600 tons in the stocks in the U.K. to a total of 15,657 tons, the contango has shown signs of decreasing. Some experts take this as an indication that those who are short of copper are covering in their open commitments. Alternatively, it can be argued that those who are short are not prepared to close their open positions, and are borrowing copper when long positions are not yet due.

TIN GAINS £10 MORE

The period of consolidation in the tin market, mentioned last week, proved to be of a very short duration, and prices

now stand at over £10 above those of a week ago. The majority of people consider that the upward movement has not yet expended itself. The buffer stock manager has probably been selling small tonnages of tin during the week, which has resulted in the maintenance of the contango which otherwise showed signs of lessening due to less offerings of maturing purchases. The fall of 311 tons in the stocks to a total of 9,616 tons might also have been expected to have resulted in a lessening of the contango.

During the week the Canadian government announced that it would sell 3,000 tons of its stockpiled tin, but only for consumption in Canada, and within the same price range as the buffer stock manager can operate. This news was interpreted as bullish, as it had been thought at one time that the metal might have been freed for sale outside Canada.

After the market on Wednesday there was an unofficial indication that the United States had agreed to sell the 4,000 tons of tin which it had available outside its main stockpile, but that this should not be sold unless the price of tin in London exceeded £850 per ton. As there was no indication that any steps were being taken to release tin from the main stockpile, this news had little effect on the market when it became realized that even with the Canadian tonnage there still remained a probable deficit between production, consumption.

Consumption remains excellent everywhere and even by February in the United States, an upturn had become apparent as the daily rate of usage was some 2 per cent higher than in January.

On Thursday the Eastern price was equivalent to £876½ per ton c.i.f. Europe.

BRIGHTENING PROSPECTS FOR LEAD-ZINC?

It has become extremely difficult to assess the prospects for the lead and zinc markets. Following the news that the United States government had agreed barter arrangements for about 45,000 tons of lead with the main Canadian producer, and had indicated the expectation that a barter deal with Australian producers would shortly be concluded for another 45,000 tons, the market showed no sustained reaction and after a short upward spurt relapsed back to its former levels.

In zinc, there are reports of better off-take from practically every source but in spite of this, offerings in London have tended to keep the market at its previous level. Stocks of both metals increased last week with an additional 50 tons of lead being returned in a total of 11,964 tons, and with zinc stocks jumping 1,112 tons to a total of 6,224 tons. It seems that this last increase has been sufficient to establish a small contango in the zinc market.

Statistics received during the week seem to indicate that the future outlook for both metals is somewhat better, as in the case of lead, daily consumption in the U.S. in February was higher than for previous months, although the short month resulted in a further addition to the build-up in producers' stocks owing to a continuing growing rate of production. Consumption figures for zinc also indicated that in February the daily rate of usage was higher than in January, whilst smelter output dropped, owing to the shorter month, producers' stocks of zinc continued to rise although consumer stocks showed a welcome fall.

The American Zinc Institute's figures for April showed a decrease of about 5,000 s.tons from the March figure, and at the same time domestic shipments increased by about 10,500 s.tons which, in spite of a decline in exports, resulted in the end of month stocks declining by about 3,500 s.tons to a total of 219,253 s.tons compared with 147,861 s.tons a year ago. It seems that pressure on the U.S. administration is leading to the probability that some support will be given to the domestic lead and zinc industries, and it is understood that the administration will be submitting measures to Congress later this month.

LONDON METAL AND ORE PRICES, MAY 11, 1961

METAL PRICES

Aluminium, 99.5%, £186 per ton
Antimony—
English (99%) delivered, 10 cwt. and over £230 per ton
Arsenic, £400 per ton
Bismuth (min. 1 ton lots) 16s. lb. nom.
Cadmium 11s. 0d. lb.
Cerium (99%) net, £15 0s. lb. delivered U.K.
Chromium, Cr. 99% 6s. 11d./7s. 4d. lb.
Cobalt, 12s. lb.
Germanium, 99.99%, Ge. kilo lots 2s. 5d. per gram
Gold, 250s. 10d.
Iridium, £20/£23 oz. nom.
Lanthanum (98%/99%) 15s. per gram.

Magnesium, 2s. 2½d./2s. 3d. lb.
Manganese Metal (96%/98%) £275/£285
Nickel, 99.5% (home trade) £600 per ton
Osmium, £18/£22 oz. nom.
Osmiridium, nom.
Palladium, imported, £8 12s. 6d.
Platinum U.K. and Empire Refined £30 5s.
Imported £28/£28½
Quicksilver, £67 ex-warehouse
Rhodium, £43/£45 oz.
Ruthenium, £14/£16 oz. nom.
Selenium, 46s. 6d. per lb.
Silver, 79½d. f. oz. spot and 80d. f.d.
Tellurium, 37s. 6d. lb.

ORES AND OXIDES

Antimony Ore (60%) basis 27s. 0d./32s. 0d. per unit c.i.f.
Beryl (min. 10 per cent BeO) 270s./275s. per 1. ton unit BeO
Bismuth 30½ 5s. 0d. lb. c.i.f.
20½ 3s. 3d. lb. c.i.f.
Chrome Ore—
Rhodesian Metallurgical (semifriable 48%) (Ratio 3 : 1) £15 5s. 0d. per ton c.i.f.
" Hard Lumpy 45% (Ratio 3 : 1) £15 10s. 0d. per ton c.i.f.
" Refractory 40% £11 0s. 0d. per ton c.i.f.
" Smalls 44% (Ratio 3 : 1) £13 5s. 0d. per ton c.i.f.
Baluchistan 48% (Ratio 3 : 1) £11 15s. 0d. per ton f.o.b.
Columbite, Nigerian quality, basis 70% combined pentoxides (Ratio 10 : 1)
Nb₂O₅ : Ta₂O₅ 165s./170s. 0d. per 1. ton unit c.i.f.
Fluorapatite—
Acid Grade, Flotated Material £22 13s. 3d. per ton ex. works
Metallurgical (75/80% CaF₂) 156s. 0d. ex. works
Lithium Ore—
Petalite min. 34% Li₂O 50s. 0d./55s. 0d. per unit f.o.b. Beira
Lepidolite min. 34% Li₂O 50s. 0d./55s. 0d. per unit f.o.b. Beira
Amblygonite basis 7% Li₂O 75s./85s. per ton f.o.b. Beira
Magnesite, ground calcined £28 0s./£30 0s. d/d
Magnesite Raw (ground) £21 0s./£23 0s. d/d
Manganese Ore Indian—
Europe (46%-48%) basis 60s. 0d. freight 73d./75d. c.i.f. nom.
Manganese Ore (43%-45%) 69d./71d. c.i.f. nom.
Manganese Ore (38%-40%) nom.
Molybdenite (85%) basis 8s. 11d. per lb. (f.o.b.)
Titanium Ore—
Rutile 95/97% TiO₂ (prompt delivery) £25/£25½ per ton c.i.f. Aust'n
Ilmenite 50/52% TiO₂ £11 10s. per ton c.i.f. Malaysian
Wolfram and Scheelite (65%) 119s. 0d./123s. 0d. per unit c.i.f.
Vanadium—
Fused oxide 95% V₂O₅ 7s. 6d./8s. per lb. V₂O₅ c.i.f.
Zincron Sand (Austrian) 65-66% ZnO £16 ton c.i.f.

Official turnovers (in 1. tons) for the week ending May 5, with the previous week's figures in parentheses, are:

Copper ... 25,675 (16,575)
Tin ... 1,165 (1,610)
Lead ... 6,425 (8,675)
Zinc ... 5,575 (5,950)

	May 4		May 11	
	Buyers	Sellers	Buyers	Sellers
COPPER				
Cash ..	£238½	£238½	£243½	£243½
Three months ..	£239½	£240	£243½	£244
Settlement ..		£238½		£243½
LEAD				
Current ½ month ..	£67½	£67½	£67½	£67½
Three months ..	£68½	£68½	£68½	£68½
TIN				
Cash ..	£850½	£851	£857½	£858
Three months ..	£854½	£855	£863½	£863½
Settlement ..		£851		£858
ZINC				
Current ½ month ..	£83½	£83½	£82½	£82½
Three months ..	£83½	£83½	£83	£83½

From magnetite to monazite—

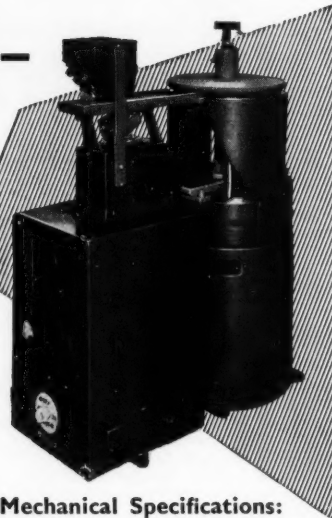
THE DAVIES '45' MAGNETIC SEPARATOR

separates them all!

No assay or mineral testing department can be complete without this Magnetic Separator—the Davies '45'. It is designed especially for laboratory and prospecting stations and will effectively separate all magnetic minerals from magnetite to monazite. A leaflet has been prepared which tells you more about it—shall we send you one?

DAVIES MAGNET WORKS LTD

THUNDRIDGE, NEAR WARE, HERTS Phone Ware 2288/9 Hertford 3334
DM 1948/A



Some Mechanical Specifications:

Variable speed feeder. Full magnet control. Solid cast bed plate, take-off chutes and collecting bins. Wired for direct operation from A.C. Mains supply. All electrics built-in and impregnated for continuous rating for tropical conditions. All mechanical wearing parts reduced to a minimum.
Nett weight: 196 lb. Boxed weight: 308 lb. Cubic Dimensions (boxed) 13 cu. ft. Overall Dimensions: 12" x 25" x 30".

Davies also manufacture:

High intensity non-entraining and induced roll heavy duty Magnetic Separators: Prospector and laboratory Magnetic Separators: Vibrating screens and Concentrating tables.

BMJ

BRECO ROPEWAYS

WHEREVER INSTALLED

use **GLOVER** STEEL WIRE ROPES for Maximum Dependability

Double G Aerial Ropes are specially designed for use on Aerial Ropeways and Cableways.

BRECO

the Big name behind the Big ropeways

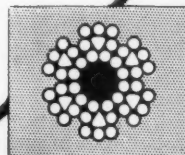
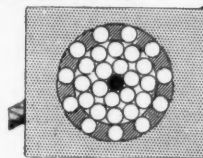
Combined with the resources of Drag Scraper & Conveyor Co. Ltd., specialists in Mechanical Handling Equipment.



member of
the
Glover Group

BRITISH ROPEWAY ENGINEERING CO. LTD.
PLANTATION HOUSE, MINCING LANE, E.C.3

Tel: MINcing Lane 7901. Telegraphic Address: Boxhauling, Fen, London.



Mining Finance

Diamond Sales Not So Buoyant

The major revelation in the full report of De Beers Consolidated Mines, the big South African diamond concern, whose profits and dividend for 1960 were commented on here on March 17, is undoubtedly that sales of diamonds last year were not quite so buoyant as the Central Selling Organization's near-record figures indicated. The C.S.O. handles rather more than 80 per cent of world diamond output and the value of its 1960 sales, as announced last January, was £89,700,000 or little below the record £91,100,000 achieved in the preceding year. (See page 555).

Now it is disclosed by the chairman, Mr. Harry Oppenheimer, that De Beers' purchasing company, Diamond Corporation, bought greatly increased quantities of diamonds produced by individual diggers in Sierra Leone, a result of the anti-smuggling measures in that country, and also a "substantial quantity" of stones from Russia under the new agreement with the Soviet which came into being at the beginning of last year. These extra amounts have to be matched against the fact that total purchases of newly mined diamonds from all sources by the market in 1960 were "considerably less" than in 1959, as Mr. Oppenheimer says. So there was a substantial increase in stocks held by the Diamond Corporation in contrast to the shortage of supplies that has been a feature of recent years in the diamond trade.

As announced last month, C.S.O. sales in the first quarter of 1961 reached a record £24,302,000, but here again Mr. Oppenheimer has a warning that "we cannot expect sales to continue at this exceptionally high level". Nevertheless, it is concluded that 1961 should be a "good year".

Meanwhile, De Beers is taking steps to ensure that it will not itself be short of the various classes of stones through the troubles in the Congo (the world's major source of natural industrial diamonds), the loss of Ghana's output to the government's Accra market and the fact that the renewal of the sales agreement with Sierra Leone is still under discussion. As previously announced, De Beers is to start producing synthetic industrial material from its South African factory early in the second half of the current year. The company formed to do this is called Ultra High Pressure Units Ltd.

On top of this a new recovery plant is to be installed at the Premier mine in the Transvaal, the group's most important producer of drilling diamonds. Finally, it has been decided to re-open the original old De Beers mine, closed down as long ago as 1908, at an estimated cost of about £1,400,000, which is timed to reach full production by 1966. This project is designed to offset falling production at other mines as they become deeper and will, Mr. Oppenheimer

says, enable production from the Kimberley group to be maintained at about its present level for many years to come.

On the subject of the new practice instituted for the March quarter of no longer giving the C.S.O. sales of gems and industrials separately, a move that has been widely regretted by financial commentators, Mr. Oppenheimer confirms that one of the reasons is that suggested here on April 14, namely the growing competition in the industrial field. So De Beers has decided that to give the figure for industrial stones separately would not be in the best interest of shareholders.

Mr. Oppenheimer's remarks about increased stocks and his warning that the present high rate of sales may not be maintained had little effect on De Beers 5s. Deferred shares, now 115s. 7½d. to yield 10.8 per cent before allowing for double tax relief on the 1960 dividend of 12s. 6d., a payment covered 1.8 times by consolidated earnings. As with other South African shares, the political factor is by far the most important market influence. Were it not for fears about the future in this respect there is no doubt that De Beers would be standing considerably higher.

UNION CORPORATION AND WINKELHAAK

The full report for 1960 of Union Corporation, the South African mining finance house, confirms our comment on the preliminary figures made on March 24 that the retention of the expanding new Winkelhaak gold mine as a subsidiary played a major part in last year's improved results. It is also pointed out that naturally not all the Winkelhaak profit that was consolidated was available for distribution, hence the transfer to Union Corporation's capital reserve account of £600,000 against nothing a year previously. (See page 554).

The corporation has also retained as subsidiaries the two developing mines adjacent to Winkelhaak in the new Kinross gold fields. There are no profits from these two concerns, Leslie and Bracken, as yet—they are not due to start production until 1963—and they actually at this stage represent a liability for Union Corporation which has potential commitments in connection with this Kinross field over the next couple of years of £6,300,000. The directors say that these commitments had to be taken into account when deciding upon the 1960 dividend.

Another interesting item of news in the report is that since the close of 1960 the corporation's non-African interests have been consolidated into a wholly-owned U.K. subsidiary company called Unicorpora, thus following the example of Consolidated Gold Fields. Unicorpora includes among its interests a £500,000 participation in Consolidated Zinc's big Australasian aluminium project, a participation that carries an option to subscribe for Consolidated Zinc shares.

The book value of Union Corporation's quoted investments has risen from £13,200,304 to £15,816,993. The market value at the end of 1960 is down by a remarkably small amount considering the Kaffir market malaise in that year. At £57,295,405 it compares with £58,694,198 at the end of 1959. Unfortunately there is almost bound to have been a considerable fall subsequently in

London Market Highlights

Plenty of highlights were provided for the mining share market by the Malaysian tin group this week. A strengthening metal price coupled with growing estimates of the likely shortfall in production in relation to demand this year set the stage for a fresh burst of Eastern and local buying. With stock in none too plentiful supply, share prices were soon jumping merrily ahead. But towards mid-week the advance was checked by profit-taking and London was beginning to wonder whether Singapore might have again over-reached itself in the buying rush.

Trading reached almost record proportions and throughout the list many new high price levels for the year were reached before the profit-taking set in. Gopeng, for example, spurted 11s. to 51s. before coming back to 48s. while Tronoh advanced 7s. 3d. to 63s. 6d. and then reacted partially to 60s. 3d. Sungei Besi (43s.) lost 2s. 3d. of an earlier advance of 5s. 9d. while Tanjong which had been lagging behind the rest of the market for some time, caught up with a spurt of 8s. 1½d. to 35s. 1½d. before settling down at 33s.

A particular favourite with the Singapore buyers was Tongkah Harbour which, having moved up 14s. to 90s. in the previous week, gained more ground to 107s. 6d. before reacting to 100s. The investment companies also showed to advantage with rises of 3s. 9d. to 46s. 3d. in British Tin and 1s. 9d. to 17s. 9d. in London Tin. Even the neglected Nigerian issues managed to improve a few pence.

Meanwhile, the Kaffir market had got off to another bad start. Some selling be-

lieved to have emanated from Switzerland affected both the London and Johannesburg centres and in the almost complete absence of any buying to help balance the offerings, share prices of the leading stocks plunged to new low levels. By mid-day on Tuesday, however, the selling, which was never of serious proportions, spent itself and the cautious reappearance of Cape buyers in thin trading conditions ushered in a tentative recovery. The rally gained strength on Wednesday when occasional bear-positions were uncovered, but trading still remained small.

Union Corporation, which had eased to a low for the year of 40s. became a much brighter market following the encouraging report and rose to 44s. 3d. Local buyers were also attracted to Gold Fields which having tumbled to 49s. 6d. promptly rebounded to 52s. 6d. Orange Free State Investment which had been very dull at 53s. 9d. soon rallied to 57s. 6d. and among the mines themselves President Brand rallied well to 45s. after having been only 41s. 10½d. De Beers improved 1s. 3d. to 115s. 7½d., although the annual report was received with less than the usual enthusiasm.

Copper shares followed the movements in Kaffirs to a modest degree. U.S. interests in R.S.T. (10s. 6d.) flickered occasionally and Roan Antelope hardened a few pence to 5s. 9d. Rhodesian Anglo American after having fallen to 57s. 9d. brightened to 59s. 6d. and Rhokana picked up to 46s. 6d. after having been languishing at around 45s. 3d.

view of the marked weakness in South African shares since January. Union Corporation 2s. 6d. shares are 41s. 3d. to yield 9.7 per cent on a dividend that was covered around three times by consolidated earnings last year. There are big growth possibilities in the corporation's profit outlook over the next decade in view of the large interests retained in the Kinross field, but their realization obviously depends primarily on South Africa's political path avoiding the pitfalls of racial upheavals.

ASSOCIATED MANGANESE DOES WELL

Associated Manganese Mines of South Africa, a member of the Anglo-Transvaal group, had a spanking good year in 1960 with the net profit more than doubled at £753,485 and the Ordinary dividend hoisted from 2s. 6d. to 4s. This meant that the Deferred shares came into the dividend picture for the first time with a payment of just under 1s. 8d. These shares rank equally with the

Ordinary for distributable profits after 3s. has been paid on the latter; that is to say until the end of the current year when the Deferred will automatically become Ordinary shares. (See page 556).

The main reason for Associated's greatly increased prosperity last year was that it had a large accumulation of manganese ore stocks at the mine and was thus able to take quick advantage of the marked improvement in demand. Consequently, no less than 414,296 s.tons were raffled for export compared with only 173,758 s.tons in 1959. There was also the new factor of iron ore production of which 108,447 s.tons were raffled for export. And the subsidiary Feralloys company, a ferro-manganese concern, had its first full year under the Associated Manganese wing and took 99,703 s.tons of manganese ore from the mine. Its profit, not consolidated with that of the parent concern, was £324,100.

After outlining the considerable developments that are taking place in Associated Manganese's mining fields the

chairman, Mr. S. G. Menell, says that the demand for its products, also those of Feralloys, continues to be satisfactory and the orders in hand reflect a sound position. The 5s. Ordinary stand at 29s. 3d. to yield 13.7 per cent before double tax relief.

SIR EWEN FERGUSSON ON TIN

The significant remarks by Sir Ewen Fergusson at the annual meeting of the Straits Trading company, one of the world's largest tin smelting concerns, played quite a part in the recent fresh advance in the prices of both the commodity and the producers' shares. It was his fresh emphasis on the dwindling world supplies of tin that had this impact plus his cutting back from 145,000 tons to a mere 120,000 tons a year of his former estimate of what the signatory countries to the International Tin Agreement may be able to produce under de-restriction, excluding on this occasion the Congo since "it is not safe to guess what quantity will be exported from that unhappy country in the near future".

Sir Ewen went on to say that it is generally accepted that the ability to produce tin in most countries will continue the downward trend of recent years. Even in Malaya in five to ten years there will be a substantial decline in output. The ability to reduce costs may make it possible to rework some previously mined ground, but this is not very likely on any grand scale, bearing in mind the current prices of special mining equipment and the heavy royalty which is extracted from producers by way of export tax.

All this is very encouraging for those tin producers which have many years' life in front of them on the basis of ground already owned, but it looks in the long run a little dispiriting for Straits Trading itself which relies on a big turnover in the metal for its prosperity. Sir Ewen thus deprecates the idea that a new smelting works may be built by Japanese interests in Port Swettenham, although the Straits company with its low smelting charge does not fear straight forward competition. Meanwhile, 1960 was the best in Straits Trading's long history owing to higher income from investments and the larger volume of tin concentrates to treat as the restriction screw was loosened. Also helpful is the renewal after a lapse of over a quarter of a century of the treatment of Indonesian concentrates. So, the chairman concludes, the company is in a very sound position and well able to meet any foreseeable eventuality.

The table appearing alongside at left summarizes the latest output positions of the world's leading tin producers plus the dividends being paid. (See also page 552).

OFSTIS' STRONG FINANCES

In the light of the present sad market circumstances in the South African gold share market, of most comfort in the annual report for 1960 of the Orange Free State Investment Trust, the O.F.S. gold share holding company in the Anglo American group, is the opinion in the review by the chairman, Mr. Harry Oppenheimer, that the financial position remains strong and that so far as can be seen no difficulty should be experienced in following up present investments and in taking up such new business as may

Tin Company Outputs and Dividends

		Tons of Tin Concentrates produced			Dividends declared ‡		
		Financial year end	This financial year to date	Last financial year to date	TOTAL	This financial year to date	Last financial year TOTAL
EASTERN							
Ampat	Dec.	138.2 (3)†	229.2†	879.2†	—	9.6d.*	
Anglo-Burma	Sept.	60.0 (3)	55.0	338.0	—	—	
Ayer Hitam	June	1274.8 (6)†	569.0†	1893.7†	7½d.	3/1.5	
Berjuntai	April	2457.5 (11)	1797.0	1967.2	—	—	
Chenderiang	March	251.8 (12)†	147.0†	147.0†	—	—	
Gopeng Cons.	Sept.	1107.2 (6)†	614.0†	1467.2†	1/6	2/3	
Hongkong Tin	Sept.	220.2 (6)†	139.2†	304.2†	—	9d.	
Iphoh Tin	March	245.8 (12)†	289.0†	289.0†	—	—	
Kampong Lanjut	March	1948.2 (12)	911.0	911.0	—	—	
Kamunting	March	1591.8 (12)	1378.5	1378.5	—	7½d.*	
Kent (F.M.S.)	(a) Dec.	98.2 (3)†	56.5†	267.5†	—	3d.*	
Kepong D.	June	260.5 (9)†	Nil	Nil	1/-	3d.	
Killinghall	Sept.	160.2 (6)†	182.0†	422.5†	—	1/3	
Kinta Kellas	March	286.7 (12)	276.6	276.6	—	6d.*	
Kramat Tin	March	621.2 (12)	508.0	508.0	—	2/6*	
Kuala Kampar	March	1523.2 (12)	944.2	944.2	—	3/6*	
Larut Tin	Dec.	88.0 (3)	Nil	119.5	—	6d.	
Lower Perak	April	1162.8 (11)	1045.0	1212.5	—	1/3*	
Malayan Tin	June	1586.5 (6)†	1247.5†	3299.2†	9d.	2/6	
Malaysiam	March	106.3 (12)†	73.1†	73.1†	—	—	
Pahang	July	1694.6 (8)†	1329.1†	2252.0†	6d.	10.8d.	
Pengkalan	Sept.	306.0 (6)†	190.5†	391.5†	9d.	1/-	
Petaling	Sept.	812.5 (6)	545.2	1129.8	—	9.8d.	
Rahman H.	June	265.4 (9)	179.9	231.9	—	—	
Rambutan	June	178.8 (9)†	98.2†	129.5†	—	3d.	
Rantau	June	553.5 (9)	379.8	537.2	1/4.8. (b)	1/4	
Renong	June	559.5 (9)†	640.5†	883.8†	—	9d.	
Selayang	Sept.	8.0 (6)	67.0	118.5	—	3d.	
Siamese Tin and Subsidiaries	Dec.	619.0 (3)†	594.0†	2681.0†	—	1/6*	
S. Kinta	March	3896.8 (12)	2686.2	2686.2	—	2/1.2*	
S. Malayan	June	1961.0 (6)†	1110.0†	2734.8†	1/3	2/5.5	
Sungei Besi	March	1450.5 (9)†	552.0†	796.5†	—	1/-*	
Sungei Kinta	Dec.	— (3)†	—	27.5†	—	—	
Sungei Way	June	945.0 (9)†	813.0†	1180.5†	1.4d.	4.2d.	
Tanjong	Dec.	193.2 (3)†	216.5†	959.8†	1/-	3/7.5*	
Tekka	March	(c) (12)	87.8	87.8	—	—	
Tongkah H.	June	1345.5 (9)	478.0	937.0	—	2/-	
Tronoh	(a) Dec.	851.0 (3)†	775.8†	3302.0†	—	3/6	
NIGERIA							
Amal. Tin	March	4808.0 (12)	3101.0	3101.0	—	6d.*	
Columbite	Dec.	722.0 (12)	417.0	417.0	—	—	
Bisichi	Dec.	175.5 (3)	143.0	625.0	—	—	
Columbite	Dec.	95.0 (3)	92.5	458.0	—	—	
Ex Lands	Dec.	128.0 (3)	135.0	540.0	—	8.4d.	
Gold and Base	Dec.	204.0 (3)	192.0	751.0	—	—	
Columbite	Dec.	12.0 (3)	20.0	79.0	—	—	
Jantar	Sept.	127.7 (6)	90.9	199.1	—	6d.	
Columbite	Sept.	185.1 (6)	114.9	238.0	—	—	
Jos Tin	July	98.2 (8)	93.5	141.0	—	8.25d.	
Kaduna P.	Dec.	17.5 (3)	17.2	77.5	—	3d.*	
Kaduna S.	Dec.	64.0 (3)	78.0	266.0	—	3d.*	
Naraguta K.	Dec.	18.4 (3)	27.2	117.0	—	—	
U. Tin	March	238.0 (12)	232.0	232.0	—	—	
Columbite	March	21.0 (12)	25.5	25.5	—	—	
MISC.							
Beralt	March	3.0 (12)	241.0	241.0	—	1/-*	
Wolftram	March	2079.0 (12)	1886.0	1886.0	—	—	
Geevor	March	657.0 (12)	648.5	648.5	—	6d.*	
Rooiberg	June	811.0 (9)	835.0	1103.0	1/6	3/6	
S. Crofty	Dec.	234.0 (3)	231.0	856.0	—	—	

(a) Output figures refer to the two immediate past financial years; figures for current year available in April.

(b) On expanded Capital.

(c) Now under Gopeng.

‡ Up to date at time of going to press.

† Tons exported.

* Final dividend not yet declared.

(Continued on page 556)

ORANGE FREE STATE INVESTMENT TRUST LIMITED

(Incorporated in the Union of South Africa)

MARKED RISE IN PROFITS

EXPANSION OF O.F.S. MINES CONTINUES

The following is from the review by **Mr. H. F. Oppenheimer**, the chairman, which has been circulated with the annual report and accounts:

The financial results achieved during the year 1960 show a pleasing improvement. Income from dividends and interest on investments rose by £324,101 to reach the figure of £3,320,409. Interest received, amounting to £51,945, was £13,495 less than the 1959 figure. Surplus on realization of investments was £14,846, as against the exceptional loss of £234,325 incurred in 1959 when the company sold the bulk of its holding in Freddie's Consolidated Mines Limited.

After allowing for all items of expenditure and also for a small liability for United Kingdom income tax, the net profit after taxation for the year was £3,129,439, as opposed to £2,654,364 in 1959. Dividends distributed amounted to 5s. per share, which compared with 4s. 9d. per share in 1959, and we transferred £365,000 to General Reserve.

Strong Finances

The net book cost of quoted investments rose during the year by £878,769 to reach a new total at the end of the year of £19,912,894.

During the year the company increased its holdings in the Harmony, President Steyn, and Free State Saaiplaas gold mining companies. The market value of the quoted securities at the year end was £51,929,075 as compared with £66,013,165 at the end of 1959. Whilst it is true that there was a widespread reaction in world markets at the beginning of 1960, the drop in the market value of this company's portfolio is also a measure of the political risk which overseas investors now feel is inherent in the South African investment field.

The financial position of the company remains strong and so far as can be seen, no difficulty should be experienced in following present investments and in taking up such new business as may eventually. Equally the company should have no difficulty in making provision for the redemption of its loan debt of

£2,023,184 which matures on June 30, 1966.

Expansion programmes on the Orange Free State gold mines are by no means complete and capital expenditure on a substantial scale is likely to be incurred for some time to come. Each mine is naturally striving to achieve optimum operational levels having regard to the quantity and grade of its ore reserves, and this effort in turn is related as far as may be possible to protection of dividend distribution from the progressive incidence of taxation which asserts itself sharply as soon as aggregate revenue exceeds aggregate expenditure.

Taxation, therefore, becomes a material factor soonest in the richest mines. President Brand became a taxpayer in 1958, followed in 1959 by Western Holdings and now by Free State Geduld and St. Helena. These mines between them are expected to put something like £15,000,000 into the hands of the State by way of lease and taxation payments in respect of the 1961 financial year.

Stake in Richest Mines

Your company's portfolio reflects a wide spread over the Orange Free State mines with a substantial stake in the richest of these. Two gold mining companies in the portfolio, Loraine and Free State Saaiplaas, have still to reach a dividend paying stage. At Loraine, with the junction of No. 2 and No. 3 shafts by a tunnel 21,000 ft. long, a tangible benefit of the Loraine-Riebeeck merger should now be enjoyed. Increasing tonnages should now flow from the Elsburg horizon to replace the marginal basal reef ore drawn from the original Loraine property.

It is to be expected that the Elsburg reefs, by virtue of their high widths, will deliver large tonnages at comparatively low cost. Development values have been most encouraging. All of which leads to the hope that the Loraine company can now reasonably look forward to a rising trend in working profits.

At Free State Saaiplaas we are hopeful that unavoidable delays and disap-

pointing early development values encountered around No. 1 Shaft, in what is possibly the fringe of the area of enrichment, will give way to an accelerated milling rate and improved grade as development spreads westward from No. 2 Shaft.

Uranium Contracts

The reduction in world demand for uranium and the increase in production in both America and Canada present South African producers with the almost certain prospect of having to close their plants when their present sales contracts with the United States and the United Kingdom Atomic Energy Authorities terminate during the years 1963 to 1966. Present indications are that the market for uranium will continue to be oversupplied until about the year 1970.

New Arrangements

The industry therefore decided to negotiate new arrangements with the British and American purchasing agencies and it has now been agreed to "stretch out" certain uranium deliveries and to adopt a fixed price for quota sales from January 1, 1961. Under the new arrangements certain low cost producers have acquired sales quota rights from other uranium producers in return for royalty payments which will compensate fully for loss of profits.

The participants in the Orange Free State Joint Uranium Production Scheme decided that the interests of their shareholders would best be served by the transfer to other producers of their quota rights and the cessation of production of uranium at both plants of the Joint Scheme, which is a high cost producer.

Shareholders in the participating companies can rest assured that uranium profits will not be diminished as a result of the new arrangements and, furthermore, the transfer of quotas against payment of a royalty at a fixed rate will eliminate any risk of earnings being affected by any rise in the general level of treatment costs.

British Mining Tools Association

ZAGREB AUTUMN FAIR

On January 10, 1961, a new association was created named the British Mining Tools Association. The original members consisted of 33 companies engaged in the manufacture of tungsten carbide mining tools, tips for mining tools or of raw materials or blanks used in the manufacture of mining tools.

To cater for the various interests of members, the activities of the Association have been divided into four sections:

- (1) Coal tools,
- (2) Percussive tools,
- (3) Carbide tips,
- (4) Raw materials and blanks.

The Association is managed by a committee of management elected by its members, together with a main technical

committee. The sections themselves have established their own technical sub-committees to work in liaison with the main technical committee.

The purpose behind the creation of this new organization is to enable interested manufacturers to co-operate with each other on common technical problems concerning mining tool specifications as well as to co-operate technically with other organizations and technical bodies in the interests of the industry as a whole. The Association also intends to play an active part in the domestic and international standardization fields.

President of the new Association is Mr. H. Eckersley (Wickman Ltd.), and vice-president Mr. E. A. Martin (Padley and Venables Ltd.). Secretary is Mr. E. A. Tuxford, Light Trades House, 3 Melbourne Avenue, Sheffield, 10.

The following members of the British Mining Equipment Export Association are sponsoring an Association stand and members' exhibits at the Zagreb Fair: Cable Belt Ltd., Clayton Equipment Co. Ltd., Distington Engineering Co. Ltd., Joy-Sullivan Ltd., Mining Engineering Co. Ltd., Oldham and Son Ltd., A. Reyrolle and Co. Ltd., Siemens-Schuckert (Gt. B.) Ltd., Wickman Ltd.

The Proprietors of British Patent No. 788,446 for "CARBONIZATION OF COAL", desire to enter into negotiations with a firm or firms for the sale of the patent or for the grant of licences thereunder. Further particulars may be obtained from Marks & Clerk, 57 & 58, Lincoln's Inn Fields, London, W.C.2.

THE STRAITS TRADING COMPANY LIMITED

At the Annual General Meeting of The Straits Trading Company Limited held in Singapore on May 3, 1961, the Chairman, **Sir Ewen Fergusson**, who presided, said:

The Reports and Accounts for the year ended December 31, 1960, having been in your hands for the prescribed time, I shall with your permission take them as read.

The year under review was the best in the Company's long history and it gives me considerable pleasure to present these Accounts to you. The cause of the better results is not far to seek—firstly our income from investments was higher, and secondly there was a larger volume of tin concentrates to treat, with its consequential fuller utilization of our smelting resources. The increased outputs were, of course, because international restriction of exports practically ceased at the beginning of last year and this meant that we benefited both on the smelting side of the business and from the better dividends which inevitably came from the tin producing companies in which we have substantial holdings.

We were also able to negotiate an agreement during last year which brought about the resumption of supplies from Indonesia. Concentrates from this area were treated by us for over forty years until they were diverted to Holland in the year 1933. The loss of these supplies lasted, except for a short period after Holland was overrun by the Germans, until the Japanese occupied Malaya at the end of 1941.

The destruction of both our works by the Japanese occupying forces was an overwhelming and costly problem which took years to overcome, especially during a period when plant and material was in short supply and when so-called priorities did not operate in our favour. I mention this in passing as we now have a works at Butterworth in which we can again take legitimate pride.

This should please the many old stockholders of the Company, as will the information that we have very recently been able to negotiate a continuation of the arrangements with the Indonesian Government which will, I am confident, be of benefit to the smelting industry, and to our Indonesian friends by the rapid conversion of their concentrates to readily marketable metal. In this latter connection the facilities of the Eastern Smelting Co. Ltd., have, through a co-operative working arrangement, been of mutual advantage to all the parties concerned.

Heavily subsidized domestic smelting in certain consuming countries has made some inroads into one of our sources of supply. In Brazil particularly, it seems that there is a penal tax on metal imports, but a substantially lower tax on tin concentrates. Brazil produces an insignificant volume of concentrates but the price she is prepared to pay for a restricted quantity of concentrates is considerably more than the total tin content—presumably with the result that there is a grossly inflated domestic metal price in that country. As payment for concentrates is not acceptable in Brazilian currency one can only conclude that

some currency of international standing is made available at artificial rates. Such competition is impossible to combat by a trading concern such as ours.

In my address last year I hazarded some figures of potential maximum production from the six producing countries signatory to the International Tin Agreement. It is clear that there are no signs of that estimated potential being reached in the near future, if ever.

I put the figure then at 145,000 tons which included 14,000 tons from the Congo and 25,000 tons from Bolivia. It is my present opinion that not more than 120,000 tons will come from the signatory countries, excluding the Congo. It is not safe to guess what quantity will be exported from that unhappy country in the near future.

In addition to this I think it is generally accepted that the ability to produce in most countries will continue the downward trend of recent years. It is inevitable, so far as one can judge from the information available at present, that even in Malaya in five to ten years there will be a substantial decline in output. The ability to reduce costs may make it possible to rework some previously mined ground but this is not very likely on any grand scale, bearing in mind the current prices of the special mining equipment required, and the heavy royalty which is extracted from producers by way of export tax.

The future of the smelting industry is closely bound to the mining industry—both will ultimately decline together unless there are discoveries of new areas for mining of which there are no present indications. With one or two exceptions no new areas have been discovered since before the last war. It is therefore surprising that there are talks of a new smelting works being built at Port Swettenham by the Ishihara Sangyo Kaisha in conjunction with a local company.

With ample smelting facilities in the Federation of Malaya, to which our contribution was originally at Teluk Anson some seventy years ago and has been Butterworth, where our up-to-date works are, for over sixty years, it is difficult to see what possible benefit can be gained for the economy of the Federation by the erection of redundant smelting capacity.

We do not fear straightforward competition and our smelting charge is low enough to make it essential for us to keep our plant in efficient condition, and for earnest cost consciousness to be the watchword throughout the organization. There is no percentage write-up on our purchases, and we do not see other than reduced employment of labour in Penang and Province Wellesley if, as a result, supplies of concentrates are diverted to an additional and unnecessary smelter.

In June this year the present Tin Agreement expires and a new one takes its place, with a new buffer stock continuing in place of the old one.

With the supply position as it is at present it is difficult to see how the manager will be able to maintain his present stock or increase it to the quantity of 12,500 tons written into the

Agreement. There is, however, a sub-clause in the new Agreement which permits the Council to decide that a portion of the contribution to be made in metal shall be made in cash, and one may reasonably assume that this will be such quantity as may be uncommitted to the market at June 30, 1961—unless, of course, there has been a rapid change from shortage to surplus in the next two months.

Normally the tonnage of tin held by the Council is published not earlier than a period of three months after the end of each quarter, but it may well be that earlier notification of the stock held at the termination of the present agreement will be given in view of the early valuation of its holdings which is called for under the relevant clauses of the Tin Agreement. In Malaya it is generally accepted that there will be a cash distribution to the original individual subscribers, and that the contribution by Government to the second buffer stock will be repaid by means of a cess on exports as was the case with the first pool.

Early distribution to the subscribers would provide considerable funds, some of which might be available for re-equipment, and for search for the new areas which are essential if Malaya is to maintain its present rate of production.

I now turn to the Accounts.

In my earlier remarks I have referred to the reasons for the better results placed before you. The Company is in a very sound position and well able to meet any foreseeable eventuality. The dividends which we recommend are well within our capacity to pay and the increased transfer to Reserve retains and strengthens the Company's position.

Works, Lands and Buildings is practically unchanged. The item has been depreciated in accordance with normal accounting practice, but essential extensions at Butterworth is the reason why the figure is not lower.

Our subsidiary interests are comfortably covered by good assets, and the net current assets are a considerable portion of the amount at which the item stands in the Balance Sheet.

Sundry Investments are higher because of short term funds in London. As is to be expected, the current market value increased substantially during the year bearing in mind that they are in the main represented by holdings in Malayan tin companies including amongst others Austral Amalgamated, Ayer Hitam, Gopeng, Petaling, Sungei Besi, Sungei Way, Tronoh, Kampong Lanjut, Idris Hydraulic, Malayan and Southern Malayan. It should not be overlooked however that they are wasting assets and that they rise and fall with the outlook for tin and the fortunes of the various companies.

Tin and Tin Ore in Stock and in Transit is higher because of the larger quantities reaching us, but is conservatively valued after making allowance for smelting, treatment and contingencies. The other items call for no comment representing, as they do, the ordinary transactions of the business.

Pelam Estate had a successful year and the expected improvement in the small Tanganyika venture duly took place. The Renong dredge on the Jinjang property was working for most of the year in difficult and lower grade ground,

but I am glad to report that better outputs are currently being won.

The British Tin Smelting Co. plant at Liverpool is being closed down and in due course will be disposed of. Residues for treatment have been difficult to obtain and our partners have decided that there is little likelihood of a profitable future in continuing the venture.

Operations at Liverpool were started in 1937 as a special measure to meet circumstances which existed at that time. There have been many changes since then and tin smelting was never resumed after the works closed down during the war under a concentration of industry measure of the United Kingdom Government. As I have mentioned earlier our subsidiary interests are safely valued.

Before making my customary reference to the staff I should like to say that Dato Loke Wan Tho has been invited to join the Board of the Company and that he has accepted. The Loke family have had a long connection with the Company as shareholders, and Dato Loke Wan

Tho's father was a member of the Board from 1906 until his death. I welcome him on personal grounds as well as for the advice and help I am sure he can be relied on to give.

There is one other point. Your Company has in the past made substantial donations to the cause of education and I am sure you will willingly pass the motion which permits your directors to decide a useful purpose for the \$100,000 which we recommend should be given to the University of Malaya, Kuala Lumpur.

Our staff have served us well and when I pay tribute to the loyal and efficient hard work they have put in during the past year I am assured that I have the support of the stockholders in recording this tribute to our workpeople and all members of the staff.

The Report and Accounts were adopted and Mr. W. H. C. Bailey and Mr. G. G. MacLennan were re-elected Directors of the Company.

SENIOR GEOPHYSICIST

Required to set up and supervise a geophysical section for both aerial and ground work in mineral exploration. Applicants should be experienced in all phases of modern geophysical techniques and have a minimum of a Master of Science in geophysics.

Eighteen months' contract including two months of vacation with pay. Liberal housing allowance and extra allowance for field work. Transportation expenses paid. Further particulars upon application.

Apply giving full details of qualifications and experience to:

The Director of Mineral Resources,
P.O. Box 345,
Jeddah, Saudi Arabia.

THE BURMAH OIL COMPANY LIMITED

MR. W. E. EADIE'S STATEMENT

The Annual General Meeting of the Company will be held in Glasgow on June 2, 1961.

The following is summarized from the Statement by the Chairman, **Mr. W. E. Eadie**, which has been sent to stockholders.

Accounts:—On a tonnage basis trade in 1960 was 7 per cent greater than in 1959. The effects of world wide competition in the oil industry, which resulted in reduced profit margins, and increased exploration costs in the U.S.A. and Canada were the main reasons for the sharp decline in Group Profit on Trading in 1960 which amounted to £4,973,030 compared with £6,880,434 in 1959. Dividends from Trading Investment and Other Dividends and Interest were £1,950,022 greater than in 1959 and after charging taxation the net profit for the year is £9,235,798 compared with £8,899,947 in 1959, an increase of £335,851. The Board has appropriated £1,326,336 to General Reserve and recommends a final dividend for 1960 of 1/4d. tax free, payable on June 16, which will absorb £5,666,312.

Burma:—The Group's share of the trade in Burma rose by 9 per cent over 1959. The Burma Oil Company (1954) Ltd. continued exploration and development operations, and each of the two refineries in the country increased its throughput by over 9 per cent. The capacity of the Syrian refinery is to be increased by some 600,000 tons per annum and the oil companies in the Joint Venture have agreed to provide 49 per cent of the new capital required for this project and a related underwater pipeline. As provided for in the Joint Venture agreement the Government of Burma has increased its shareholding in The Burma Oil Co. (1954) Ltd., and now has a 51 per cent interest. In recent negotiations, carried out in a spirit of cordiality and goodwill, the Government agreed not to exercise for 15 years its right to acquire further shares in the Joint Venture.

Pakistan:—Our share of petroleum product sales increased by some 2½ per cent only. Gas sales in 1960 totalled the equivalent of 514,000 tons of fuel oil compared with 388,000 tons in 1959, the greater part of the increase arising from growing offtake through the Sui-Multan pipeline. Pipeline extensions north of Multan are under consideration. While large gas reserves have been found in recent years only moderate discoveries of new oil reserves have been made. Prospecting by Pakistan Petroleum Ltd. continued throughout the year in both East and West Pakistan. The Sui Gas Purification Plant has been extended to meet increasing demands for gas in West Pakistan, while in East Pakistan gas sales from the Chhatak field to a cement factory have started and the Sylhet field will supply gas to a fertilizer factory at Fenchuganj. Work is going ahead on the construction of an oil refinery at Karachi which is due for completion in 1962.

India:—Product demand in 1960 was around 7 million tons and is expected to be twice that amount in six year's time. Our share of the sales was some 7 per cent higher than in 1959. The product price formula mentioned last year has reduced the margins allowed to the oil companies; and the Government of India has established an Oil Price Enquiry Committee which has been conducting an exhaustive investigation and is expected to report shortly. Oil production operations by the Assam Oil Company Ltd. continued at Digboi; and in the Nahorkatiya, Hugrija and Moran areas of Oil India Private Ltd. extension and development drilling has again been successful. Discussions have recently been resumed with the Government of India on exploration outside the concessions held by Oil India. The authorized share capital of Oil India is Rs. 50 crores, of which the first share issue (Rs. 12 crores) was made in February 1959, and during 1960 there was a further issue of Rs. 9 crores. The

total amount required for the development of the oilfields is estimated at Rs. 28 crores, and at the end of 1960 your company had contributed Rs. 14 crores (£10.5 millions) towards its two-thirds share of this requirement. Construction work on the Oil India pipeline from the oilfields to Government refineries at Gauhati and Barauni began towards the end of 1960 with The Burma Oil Company (Pipe Lines) Ltd. superintending the design and construction of the project. The estimated cost of the pipeline is £35 millions of which £21 millions will be incurred in rupees and the balance in foreign exchange. As mentioned last year, Her Majesty's Government has made a loan of £3 millions to the Government of India towards the foreign exchange requirements for this line and your company has agreed to provide a loan of approximately £11 millions for the balance of the foreign exchange. The rupees required will be borrowed in India by Oil India Private Ltd. The closing months of the year saw the entry into the market of a Government distributing organization, the Indian Oil Company, which will handle products from Government refineries. Meantime that Public Sector company is distributing and selling imported Russian products. This is a disquieting sign and it remains to be seen what effect this competition will have on market conditions.

U.S.A.:—The Burma Oil Western Company, in association with Murphy Corporation and others, participated in drilling in the Gulf of Mexico and arrangements are being made to obtain production from offshore wells successfully completed in different areas.

Canada:—B.O.C. of Canada Ltd., in conjunction with Murphy Corporation, carried on prospecting operations in the Liard River area of Northwest Territories.

Australia:—B.O.C. of Australia Ltd. has been incorporated in that country to participate in joint operations with Murphy Corporation and Camelot Nominees. A marine seismic survey was begun in an area in the Gulf of Papua.

UNION CORPORATION LIMITED

(Incorporated in the Union of South Africa)

The following is extracted from the Report of the Directors for 1960

On 14th February, 1961, the currency of the Union of South Africa was converted to a new basis in which the primary unit is the Rand (R), which is divided into cents (100 cents = R1). The conversion rate between the old currency unit and the new is £1 = R2. Since the Corporation's financial year ended on 31st December, 1960, before the introduction of the new currency unit, the 1960 Accounts were struck in terms of the old currency unit. However, a comparative column has been added to the summary of the consolidated results for the year set out below.

As a consequence of the change in currency the share capital of the Corporation which has not altered in the course of the year, is now expressed as R2,500,000 in 10,000,000 ordinary shares of 25 cents each. The Corporation has also outstanding R4,000,000 of 6½% registered unsecured Notes 1974/83 which were issued in 1958 and 1959.

RESULTS FOR THE YEAR

The Consolidated Profit for the year was £3,688,458, the highest in the Corporation's history. Appropriations have been made from it as indicated below.

1959 £		1960 £	Rands
	CONSOLIDATED PROFIT FOR THE YEAR attributable to the Corporation (after providing for taxation)	3,688,458	7,376,916
2,856,915	DEDUCT :		
	Expenses of Note and New Share Issues	£727	1,454
3,232	Dividends declared £1,231,250		2,462,500
1,148,437			
1,151,669		1,231,977	2,463,954
	RETAINED BALANCE OF CONSOLIDATED PROFIT FOR THE YEAR	2,456,481	4,912,962
1,705,246	Balance brought forward from 1959	1,201,316	2,402,632
1,146,070			
2,851,316		3,657,797	7,315,594
	DEDUCT :		
	Transfer to Reserves of Union Corporation—		
	Exploration Reserve		
150,000	Account .. £150,000		300,000
	General Reserve		
300,000	Account .. £250,000		500,000
	Transfers to Reserves of Subsidiary Companies—		
	Exploration Reserve		
—	Accounts £175,000		350,000
	General Reserve		
1,200,000	Accounts £1,250,000		2,500,000
	Capital Reserve		
—	Accounts £600,000		1,200,000
1,650,000		2,425,000	4,850,000
£1,201,316	Balance carried forward to 1961	£1,232,797	R2,465,594

The Directors, as on previous occasions, have thought it wise to write down the book cost of certain holdings below both cost and market price to allow for the wasting nature of a substantial part of the portfolio, and have consequently charged the Profit and Loss Account with £150,000, of which £75,000 has been charged in the accounts of a subsidiary company.

The consolidated profit for the year includes the Corporation's equity in a subsidiary mining company's profits, some portion of which was retained for financing shaft-sinking and other capital development and, hence, was not available for distribution. For this reason the Directors have transferred to Capital Reserve Account the sum of £600,000.

The Corporation's commitments to subsidiary mining companies were reduced during the year from £8,800,000 to approximately £6,300,000, which sum it is anticipated will be required during the next couple of years.

When considering the dividend for the year the Directors had again to take these commitments into account. Nevertheless in

view of the satisfactory progress of the Corporation's Kinross area gold mines and of the present dimensions of the Corporation's income available for dividends, they felt justified in increasing the distribution for the year. Furthermore, they have decided that, commencing with the final dividend for 1960, dividends will be declared in South African cents per share and, in the interests of simplicity, free of United Kingdom income tax. The final dividend for 1960 has been declared at 18½ cents per share, free of tax, the equivalent of a declaration of approximately 3s. 0½d., less U.K. income tax at a standard rate of 7s. 9d. in the £. This makes, with the interim dividend of 1s. 0d. per share less U.K. income tax, a total distribution for the year equivalent to 4s. 0½d. per share less U.K. income tax, 24½ cents free of tax, as compared with 3s. 9d. per share (approximately 23 cents free of tax) in respect of 1959.

THE UNION CORPORATION GROUP OF COMPANIES

On the East Rand record tonnages and higher profits were achieved by The Grootvlei Proprietary Mines, Limited and Marievale Consolidated Mines, Limited. Operations at East Geduld Mines, Limited continued to be satisfactory although mining difficulties are increasing, whilst at Van Dyk Consolidated Mines, Limited, which now has only a short profitable life remaining, the profits were substantially less than in 1959. Geduld Proprietary Mines, Limited, whose mine is also approaching the end of its life, announced during the year its intention of consolidating its future by adding to its investments and retaining a proportion of profits for this purpose. Amongst the newer companies St. Helena Gold Mines, Limited, in the Orange Free State, and Winkelhaak Mines, Limited in the Kinross area continued to expand both their operations and their profits whilst adding substantially to their ore reserves. At Bracken Mines, Limited and Leslie Gold Mines, Limited, the two new Kinross area companies formed in 1959 to take over lease areas to the west of Winkelhaak Mines, shaft sinking continued throughout the year. Two shafts have now intersected the reef on each property and since the year-end a start has been made on underground development work.

South African Pulp and Paper Industries, Limited had a very good year and has now completed the installation of the first newsprint plant in Southern Africa.

In Mexico, San Francisco Mines of Mexico, Limited, had a better year and was able to pay a dividend for the first time for three years — though since the end of the company's financial year the deterioration in the base metal market has adversely affected its results once more.

The principal United Kingdom operating companies of the Group, Bay Hall Trust Limited and Wilkes Berger Engineering Company Limited (in which the Corporation and Bay Hall Trust jointly acquired a controlling interest at the beginning of 1960) both had good years.

Late in the year the Corporation formed a company, Unices Limited, to set up a plant in the United Kingdom to manufacture corrugated cardboard containers. South African Pulp and Paper Industries assisted in the preliminary investigation of this project and has taken a substantial investment in it.

After the end of the year under review the Corporation's non-African interests were consolidated into a wholly-owned United Kingdom subsidiary company, Unicorpora Limited.

EXPLORATION

Exploratory drilling outside the three lease areas in the Kinross field was continued during the year. The Corporation continued to be active in the search for gold and other metals and minerals elsewhere.

DIRECTORS

The Directors record with deep regret the untimely death in July last of Mr. A. V. Conrad. Mr. R. H. MacWilliam, a Manager of the Corporation in London, was appointed a Director in September 1960.

The full Report and Accounts (copies of which can be obtained on application at the London Office, 95 Gresham Street, London, E.C.2) include further details of the progress of the companies under the administration of the Corporation, brief particulars of the progress of other companies in which the Corporation is interested, sections dealing with the South African Gold Mining Industry and statistics of World Gold Production, Consumption, Distribution and Reserves and the Corporation's Trade Cycles Chart, revised to date.

Chairman's Statement: **DE BEERS CONSOLIDATED MINES LIMITED**
Incorporated in the Union of South Africa

De Beers Well Equipped to Meet the Difficult Times Ahead in Africa

MR. H. F. OPPENHEIMER POINTS TO SIGNS OF 1961 BEING A GOOD YEAR

The following is from the statement by the Chairman, **Mr. H. F. Oppenheimer**, which has been circulated with the annual report for the year ended December 31, 1960.

Sales of diamonds by our organizations in 1960 at £89,700,000 were less by £1,435,000 than in 1959. This comparatively small decrease was made up of a decrease of £1,853,000 in sales of industrials and of a small increase of £418,000 in the sale of gems. These results must be considered in relation to the fact that greatly increased quantities of diamonds produced by individual diggers in Sierra Leone and also a substantial quantity of diamonds mined in Russia were purchased during the year by our subsidiary, the Diamond Corporation. The Russian purchase represents a new addition to the world production but the large increase in our Sierra Leone purchases probably reflects a corresponding reduction in the volume of diamonds previously marketed through illicit channels. While, therefore, our sales for the year must be regarded as satisfactory, the total purchase of newly mined diamonds from all sources by the market in 1960 were considerably less than in 1959, and our increased purchases from Russia and Sierra Leone, without any corresponding increase in our total sales, was one of a number of factors responsible for a substantial increase in the stocks of diamonds held by the Diamond Corporation. I am glad to be able to say, however, that we have made a very good start with our sales for 1961. Sales for the first quarter of the year amounted to £24,302,000, which is a record figure. While we cannot expect sales to continue at this exceptionally high level, the indications point to 1961 being a good year.

Expansion at Premier

The policy of the Government of Ghana, that all diamonds produced in that country must be sold through the market in Accra, made it impossible for us to renew our contracts with the Consolidated African Selection Trust and Akim Concessions. Similar action by the Government of the Republic of Guinea prevented the continued operation of our contract with the Societe Guineenne de Recherches et d'Exploitations Minières. Of the three contracts affected in this way, it is only the Consolidated African Selection Trust contract which is of real importance. It is perhaps fortunate that, in all the circumstances, the Ghana diamond production should be of a very specialized nature. About 90 per cent of these diamonds consist of industrials, of which the most important part is drilling material and boart. The market for drilling material has been for some years, and still is to a great extent, dependent on stockpiling by the United States Government. The prospects for the

future for this part of the trade are therefore extremely difficult to estimate. We would not, however, like to find ourselves in a position in which we could not meet the requirements of our established customers for these qualities of diamonds, and it is against this background that we recently took the decision to erect an additional recovery plant with a capacity of 500,000 loads per month at the Premier Mine in the Transvaal. The erection of this new plant will ensure that our Group will continue to be a leading factor in this sector of the market for industrial diamonds.

Synthetic Diamonds

Shareholders will be aware that we have made arrangements to start the manufacture of synthetic industrial diamonds on a commercial scale. The material that we produce is an abrasive diamond grit used in the manufacture of grinding wheels. The product is similar to that being marketed by the General Electric Company, and production is scheduled to start early in the second half of this year. While the factory has been designed on a substantial scale and will be capable of producing a very large caratage, it is intended, so long as supplies of Congo boart are delivered in the normal manner—which I am glad to say is now the case—to operate the new factory on a restricted basis only. The Societe Minière du Beceka are interested indirectly with us and we have acted, and will continue to act, in this matter in close co-operation with them. The decision to start commercial production of this material was preceded by exhaustive experimental work and testing of the relative merits of natural grit and of the synthetic grits produced by us and the General Electric Company. Our conclusion is that natural diamond is distinctly superior in many operations to either of the synthetic grits. Nevertheless, there is no doubt that the synthetic grit has a very useful function, and we believe that the market for diamond abrasives can be expanded to accommodate both the natural and synthetic products.

At Kimberley, we have decided to reopen the old De Beers Mine, which has been closed down since 1908. Preliminary recovery should commence in about two and a half years' time and the mine should be brought into full production by 1966. Production from the De Beers Mine will fill the gap caused by the falling off in the production from our other mines as they become deeper, and will enable us to maintain production from the group of mines in Kimberley at about its present level for many years to come.

During the year we continued with our policy of investment outside the diamond industry and, in doing so, we have further strengthened and broadened the

basis of the company. A very important development was our participation with a number of other leading financial houses in Southern Africa, Great Britain, and North America in the major expansion of the Rand Selection Corporation Limited. Rand Selection Corporation is now the largest investment company in South Africa with an exceptionally sound and well-balanced portfolio. Our interest, direct and indirect, in the Corporation amounts to nearly 50 per cent of the total capital and I am satisfied that this holding gives us particularly attractive means of participating in the general development of Southern Africa outside our own sphere of diamond mining and trading.

The additional investments we have made during the year and the financing of a substantially increased stock of diamonds have been effected whilst still retaining a very strong cash position. The net cash assets of our company and its subsidiaries at the end of the year amounted to £43,016,358 and, in addition, both the gem and industrial marketing companies in which we are substantially interested, but which are not our subsidiaries, maintained strong cash positions for the protection of the trade. The present is an anxious time for all of us who are interested in Africa, but our company is well equipped to meet the difficult times that lie ahead.

Obituary

PROF. CECIL WILLIAM DANNATT

Professor Cecil William Dannatt, who died recently, was one of Britain's most distinguished metallurgists.

He graduated from the Royal School of Mines in 1914 and, after war service, he returned there as a research assistant. He soon joined the teaching staff, however, and became an authority on metallurgical analysis, and later, on extraction metallurgy. He was placed in charge of the extraction side of his department in 1937, and was appointed assistant professor and London University reader in metallurgy. He became acting director of the department in 1943, succeeding to the Chair two years later which he held until his retirement in 1957, when the title of Professor Emeritus was conferred on him. In 1960, he became a Fellow of Imperial College.

During recent years, Professor Dannatt was dean of the Royal School of Mines, vice-president of the Institution of Metallurgists and president of the Institution of Mining and Metallurgy. At the Royal School of Mines he took the leading part in the formation of the Nuffield Research Group in Extraction Metallurgy, which has developed into one of the leading schools of research in this field.

Board Changes

It is announced that Mr. Keith Courtney Acutt, C.B.E., has been appointed a director of The Consolidated Mines Selection Co. Ltd.

★

Sir Ronald L. Prain, chairman of the Rhodesian Selection Trust Group of Companies, has been appointed chairman of the Commonwealth Council of Mining and Metallurgical Institutions, in succession to Lord Bailieu.

THE ASSOCIATED MANGANESE MINES OF S.A. LIMITED

(Incorporated in the Union of S. Africa)
**SUBSTANTIALLY IMPROVED
RESULTS**

The 26th annual general meeting of The Associated Manganese Mines of South Africa Limited will be held on June 15 in Johannesburg.

The following is an extract from the circulated review of the chairman, Mr. S. G. Menell:—

The large orders secured for delivery during 1960, which I mentioned in my review of last year, resulted in the increased railings for export of 414,296 tons during the year as compared with 173,758 tons for the previous year. In addition to this tonnage 99,703 tons were despatched for local consumption at Feralloys Limited. Railings of iron ore for export during the year totalled 108,447 tons and the expansion of this market is largely dependent upon the availability of South African Railways transportation facilities.

The excess of income over expenditure (inclusive of that of the wholly-owned subsidiary, Gloucester Manganese Mines (Postmasburg) Limited), is £1,072,993 as compared with £492,896 for the previous year. The ferro-manganese plant of the wholly-owned subsidiary, Feralloys Limited, has been operating satisfactorily throughout the year and has resulted in a trading profit of £324,100 thus the combined trading profit of your company and its wholly-owned subsidiaries is £1,397,093.

An interim dividend of 1s. 6d. per ordinary share was declared in June, 1960, and in December, 1960, a final dividend of 2s. 6d. per ordinary share was declared. In December, 1960, a maiden dividend payable to deferred shareholders was declared and absorbed £99,670, or approximately 1s. 7.934d. per deferred share.

Developments

Considerable developments are taking place in the mining fields in which your company is operating. The South African Railways have extended the existing railway line northwards from Sishen to Hotazel. This line passes through your company's mines of Adams and Devon which are supplying ore to Feralloys Limited. Private sidings and loading facilities are being constructed by your company at these two mines. The road transport of ore from the Blackrock mine to railhead will be considerably reduced as a result of the extension of this railway line.

The Electricity Supply Commission is extending its supply facilities to the Kuruman and Postmasburg district and your company is to avail itself of power from this source at the Beeshoek, Gloucester, Adams and Devon mines. At the Beeshoek iron ore mine a private siding has been completed and a loading plant is in course of construction. The main loading bin has already been brought into commission.

The demand for the products of your company and Feralloys Limited continued to be satisfactory and the orders in hand reflect a sound position.

Your company was registered on November 2, 1935, and I wish to place on record your board's gratitude to the many loyal employees who have served the company during its twenty-five years of operation.

MINING FINANCE—Continued

eventuate. Equally Ofsits should have no difficulty, it is added, in making provision for the redemption of its loan debt of £2,023,184 which matures on June 30, 1966. (See page 551).

The net book cost of quoted investments rose during 1960 by £878,769 to a new total of £19,912,894 with increased holdings in Harmony, President Steyn and Free State Saaiplaas. The market value of these investments, however, dropped by just over £14,000,000, to £51,929,075 and must have inevitably suffered a good deal of further erosion since. Unfortunately Mr. Oppenheimer is only stating the obvious when he says that the drop in value of the portfolio is in part a measure of the political risk which overseas investors now feel is inherent in the South African investment field.

On the other hand, Mr. Oppenheimer can take justifiable pride in his outline of the notable achievements in the Orange Free State gold field where the mines earned an aggregate working profit of about £46,000,000 in 1960 or some 36 per cent of the total earned by the South African gold-mining industry as a whole. Politics permitting, the record of growth here should go on. Ofsits 10s. shares are 57s. 6d. to yield 8.7 per cent. They could be well in the van of any real recovery in Kaffirs.

BRIGHT OUTLOOK FOR BISICHI

Bisichi's fiftieth year has been a prosperous one from its tin-columbite operations in Nigeria but a slight note of caution creeps into the annual statement by the chairman, Mr. W. J. C. Richards. The demand for columbite is not as strong as it was a year ago when consumers were keen buyers and purchases ran into distant deliveries. Pyrochlore is becoming a competitor for its niobium content. This cautiousness does not prevent the chairman from describing the company's prospects for the current calendar year as bright.

The holding acquired in the neighbouring Jantar as a result of Bisichi's abortive attempt to gain control of that company will become revenue producing in 1961. Mr. Richards revealed that as a result of this bid Bisichi eventually acquired 500,000 Jantar out of the 1,800,000 2s. 6d. stock units in issue. The terms were one Bisichi 2s. 6d. share plus 1s. in cash for each Jantar. The respective prices now are 5s. 4½d. for Bisichi and 6s. 3d. for Jantar or almost exactly in line with the terms. Bisichi, however, give the best yield, the return on the 22½ per cent dividend for 1960 being 10.5 per cent. They appear undervalued in the light of the boom that has been going on in Malayan tin shares. After all Nigeria does not look all that bad a political prospect in relation to Malaya.

GOLD FIELDS' NEW U.S. ZINC PROJECT

Consolidated Gold Fields of South Africa, the London-based mining finance house, is further spreading its wings outside the African Continent by going ahead with a lead-zinc prospect in America at an estimated cost of nearly \$6,000,000. Briefly, Tri-State Zinc, which is a wholly-owned subsidiary of Gold Fields Mining and Industrial in turn a wholly-owned subsidiary of Gold Fields, is entering into a joint venture agreement

with the American Zinc, Lead and Smelting company. Tri-State will mine and mill zinc ore deposits owned by American Zinc near New Market, Tennessee.

It is estimated that the orebodies will provide at least 20,000,000 tons of ore from which high-grade zinc concentrates can be produced. The mill to handle 2,800 tons of ore a day should be completed during the summer of next year and will be ultimately increased to 3,600 tons. The mine should reach production at 2,400 tons a day by the summer of 1963. While output is being expanded excess mill capacity will be utilized for milling ore from American Zinc's nearby mines.

The \$6,000,000 cost will be returned to the partners by instalments based on the tonnage of zinc concentrates produced. After this, profits will be distributed on a basis varying between 50 and 60 per cent to Tri-State until all the capital is returned. Then the venture will be a simple 50-50 project. Sir George Harvie-Watt, the Gold Fields chairman, thinks that this venture will be the forerunner of other new G.F.M.I. enterprises in North America.

MINING YEAR BOOK

Mining Year Book—1961 Edition. Compiled by Walter E. Skinner, and published by W. E. Skinner and *The Financial Times*, 795 pp. Price 40s. (42s. post free).

This invaluable publication contains complete particulars, brought up to date annually, of 1,000 mining and metal companies, operating in all parts of the world, and covering all branches of the industry. The book also contains tables for the past three years of world production of gold and base metals, and a buyers' guide comprising over 2,000 headings. Many other features included are of use to all interested in any aspect of the mining industry.

★

The following have resigned from the board of Ankobra River Power Co. Ltd.: Mr. C. S. Goddard (chairman), Mr. J. W. Price, Mr. A. Hedley Williams. The following have been appointed to the board: Hon. E. Ayeh-Kumi (chairman) (Mr. A. E. T. Adjei, alternate to chairman), Mr. E. A. Sackey, Mr. Mark Botsio, Mr. S. H. Robinson (alternate—Mr. G. Munro).

★

Mr. P. Linz has been elected President of the newly organized Primary Metal and Mineral Corp., of New York. Additional directors are Mr. J. Ginsberg, Mr. I. Witkin, and Mr. George Christman.

★

Mr. H. W. G. Hignett and Mr. Jean M. Dhavernas have been appointed directors of The International Nickel Co. (Mond) Ltd.

★

The British Coal Exporters Federation have offered to place at the disposal of other sectors of British Industry, free of charge, such special contacts, experience and access as they enjoy in export markets, particularly in Western Europe. Inquiries should be addressed in the first instance to Mr. J. A. Raven, The British Coal Exporters Federation, Victoria House, Southampton Row, London, W.C.1.

lt-
nd
by
et,

ill
re
es
le
m-
ar
00
on
of
ed
or
oy

to
ne
d.
on
er
is
a
e-
ks
er
in

n.
d
e
s.

as
e
al
e
e
es
-
a
0
d
et

e
:
r.
s.
o
-
o
k
-

t
l
-
r.

n
d
.

n
f
e
-
-
t
n
a
.
-